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THESIS

Color in Advertising

by

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(A.B. Union College 1942)

submitted in partial fulfillment of
the requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

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Preface.

Full color is a dynamic selling force of special value today. By picturing your product in beautiful, natural color or presenting it in use against a background of color that gives it emphasis or contrast, you give authenticity and realism to your illustrations that can be obtained in no other way. However, your product does not have to be colorful in itself to be presented effectively in full color. Objects without color such as hearing aids, eye glasses, cooking utensils, telephones, business machines, machine tools, and services such as insurance, education, and banking can be presented most dramatically by using full color to stress the benefits they give or the natural settings in which they are used.

Advertising material in full color has warmth and life, is persuasive, commands attention, and transmits sales messages quickly and permanently. Reinforcing the power of the printed piece, full color holds interest, reflects quality, builds prestige, and brings response. It has everything you need to win your battle with competition. Whatever your product, you can sell it easier, faster, by putting the selling power of full color into your printed advertising.

This is the age of color! The public, through long association with advertising in national magazines, direct mail, car cards, and billboards and recently in newspapers, have come to expect and demand color in their advertising. Because of this and that people at large have definite color preferences, though these preferences may change, and they are almost always of an elementary order; the task of

the advertiser is one of picking a color or combination of colors for use in his advertisements that appeal to the public taste, and their definite color preferences.

The average person, when asked to write down all the colors he can recall, will list about 30 or 40. And out of these 30 or 40 almost half will be duplicates, as far as generic terms are concerned -- crimson, ruby, vermilion, for example, being descriptive of red.

Being so inarticulate in speaking of color, people are naturally exposed in their emotional preferences. Were they at all exacting about subtle hues and modifications of hues, the dictionary would be packed full of appropriate definitions. Even as it is, most colors have borrowed identifications: rose, violet, orange, peach, emerald, amber, etc.

There are about 18 colors that can be named by the average person with any assurance that others will know what he is talking about. They are the hues that will arouse the most attention value in an advertisement or a display and sell the most merchandise. Here they are: red, orange, yellow, green, blue, violet (or purple), pink, buff (ivory or cream), flesh (or peach), lavender (or orchid), brown, maroon, tan, white, gray, black, gold, and silver. While such names as beige, ecru, mauve, and the like may be understood by a few who are trained in colors, they are meaningless to the public and therefore do not sell well in the market.

The first decision of the advertiser after he has made up his mind to use color in his advertisements, is not how to use it, but what colors should he use to sell his product.

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I. A Short History of The Use of Color in Advertising.

"This is the age of color", has often been said in the past years. Advertising has taken color as one of its chief tools. Examination of a recent issue of The Saturday Evening Post [1] containing 70 full-page advertisements shows that 72.9 per-cent of the total were printed in color. As this involves heavy additional expense, it amply proves that the large advertisers of America have come to the conclusion that color pays.

Advertising itself dates back to prehistoric days, while the use of color only dates back to the middle ages. It was in the middle ages, when signs made their appearance over the shop and tavern doors. It was these signs that contained the first color in advertising. The barber pole, with its red and white stripes suggesting surgical bandages, is one of the signs that still prevails.

Anything comparable to modern advertising dates back to about the year 1445, when Johann Gutenberg, of Mainz, Germany, invented the movable types. William Caxton, English printer, put out one of the first handbills around 1480 and since this was used to show a sample of Caxton's work, no doubt it contained hand painted or colored ink capitals, because the first known color printing dates back to the Fust and Schoffer Psalter of 1457. Back in the 16th century, the title pages of the pamphlets used as goodwill advertising in Elizabethan Days had some hand painted or possibly printed color.

[1] March 1, 1947, Vol. 219, No. 35.

With the coming of better printing methods, the use of color in advertising rose to a more important height. Better production methods, mass production, increased competition between manufacturers and retailers led to more advertising. Color became important, for a colored trade mark had a more lasting effect on the potential buyer. Color added to the package even had its effect on the consumer, for the name of the product may be forgotten, remembrance of the colored package seen in the advertisements recalled the products when it was seen on the store shelves.

Until about 1915, color in magazine advertising was confined very largely to the cover positions. Then in the early twenties, there was a very marked increase in the use of color in advertisements in the inner pages of the magazine. Closely allied to color in magazines was the introduction of rotogravure sections in newspapers. Table I, page 10, gives definite figures of the total number of full pages in The Saturday Evening Post year by year from 1907 to 1922 and the number of full page advertisements printed in colors other than those on the cover pages.

From the table, it can be seen that the number of color pages increased very little from 1907 to 1922. From 1912 on, the number grew more rapidly and in fact very rapidly after 1915. It will be noted also that the number of color pages remained or increased during the war years and after, while the total full pages dropped after the war.

Comparing one weekly issue of the Post[1] today with those figures, 163 pages in the issue, of these 70 had full page advertisements.

[1] March 1, 1947.

Table I.

Total Number of Full Page Advertisements and The Number and Percentage of Colored Advertisements, 1907 - 1922

Year	Total	Color	Percent
1907	179	1	00.5
1908	268	5	01.9
1909	467	4	00.9
1910	672	2	00.3
1911	731	3	00.4
1912	837	20	02.4
1913	927	17	01.8
1914	1,008	10	01.0
1915	1,000	23	02.3
1916	1,607	95	05.9
1917	2,377	203	08.6
1918	2,585	380	14.6
1919	5,388	868	16.1
1920	4,903	1,344	27.4
1921	2,705	793	28.1
1922	2,907	813	28.0

(Starch, Daniel, Principles of Advertising, pg. 579.)

Table 1.

Total Number of Full Page Advertisements and The Number and Percentage of Colored Advertisements. 1907 - 1922

Year	Total	Color	Percent
1907	179	1	00.5
1908	208	3	01.9
1909	847	8	00.9
1910	672	2	00.3
1911	721	3	00.8
1912	827	20	02.8
1913	927	17	01.8
1914	1,008	10	01.0
1915	1,000	23	02.3
1916	1,207		

This is 42.7 per-cent of all pages. Of this 70, 19 advertisements were black and white, or 27.1 per-cent of the total; while 51 advertisements were colored, or 72.9 per-cent of the total full page advertisements in that one issue of Saturday Evening Post.

Catalogs also increased in the use of color from 2.5 to 10.1 per-cent for the same period from 1907 to 1922.

The increased use of color was due to the imitation by others of the successful advertisers. It is apparent that the ability to gain attention declines in proportion to the increase in the use of color. Yet in spite of this fact the use of color continues on an increasing scale. Why do the advertisers still use color? Four of the strongest reasons are as follows: (1) Attempts at realism. The advertiser wants his product as life-like as possible. How else can he do it in printing, if he does not use color? (2) Attract attention. The advertiser wants you to stop and see his advertisement. How is he going to do it, if he does not have some startling color to catch youreye? (3) Primarily distinction of display. The advertiser may only have to add one color to his advertisement to do this, but how can he do it without color? (4) Assumed psychic attributes of color. All colors produce certain effects upon the human race. Red and orange convey the suggestion of heat. How else is the advertiser of heating appliances going to convey heat, unless he uses color?

The use of color in advertising has come a long way since the first barber pole was put out in the middle ages. Since large advertisers of America have come to the conclusion that color pays, it

would pay us to look into the physical nature of color, which is taken up in the next chapter.

II. Physical Nature of Color.

A. What is Color?

Many of us have an idea what color is, but is it correct? Until recent years, comparatively speaking, Aristotle's theory of color was believed. It was that colors were blends of light and dark, or white and black. Then Newton developed the emission theory around 1666, this theory is based on Newton's accidental discovery that when sunlight passed through a prism it was converted into a rainbow. Yet this accidental discovery and Newton's experiment led to a truer understanding of light and color and has gone down in history as one of the greatest of all scientific discoveries.

Newton believed that light consisted of particles which spun about and whirled through space. There were seven primary atoms and seven primary hues, red, orange, yellow, green, blue, indigo, and violet. Today we omit indigo. Newton said the atoms of red were large in size; those of violet small. They all moved at the same speed, and when they struck the eye they produced sensations of color. The above conception was called the emission theory.

Later it was found that light traveled in waves, and for a while Newton's ideas were discredited. Today, however, the scientist admits both an atomic structure and a wave structure in light. Now science tells us that light is a product of electromagnetic energy. From a look at Diagram I, page 14, it will be seen that the complete electromagnetic spectrum is vast and includes a great variety of rays of which visible light and color rays are but a small part. Scientists speak of this

The Electromagnetic Spectrum

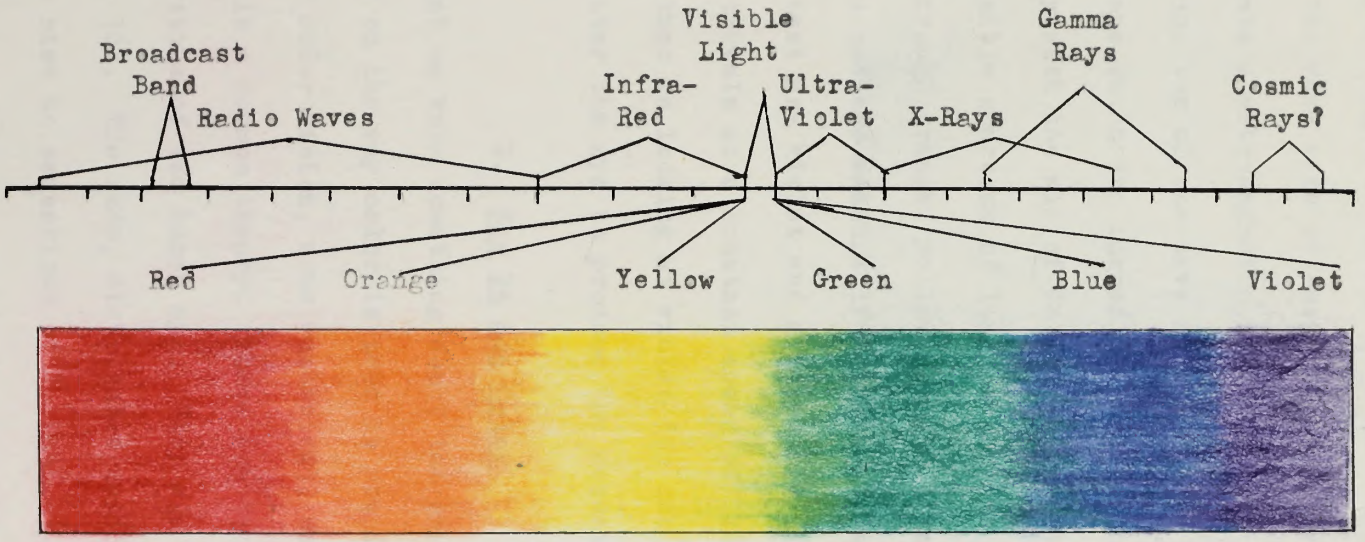


Diagram I.

(General Printing Ink Corp., Notes on The Science of Color, pp. 8-9)



diagram as having from sixty to seventy octaves, of which visible light is but one octave.

All electromagnetic energy is identical, except in wave length. It all moves at the same rate of speed. Radio waves, however lie at one end of the complete electromagnetic spectrum, are quite long and measure 2,000 feet from the top of one wave to the top of the next. At the other end lie radium rays which are incredibly short from crest to crest and are measured only with the aid of intricate scientific devices.

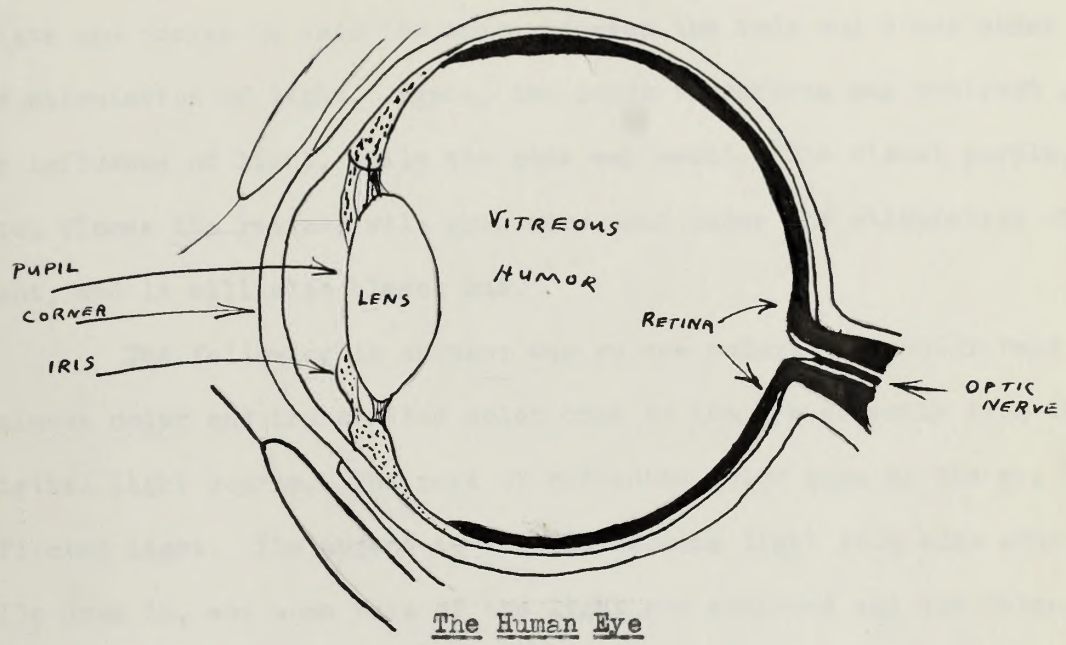
The visible spectrum of light and color contains waves which range from red through orange, yellow, green, blue, into violet. The longest waves are red and measure 1/35,000th of an inch from crest to crest. The shortest are violet and measure 1/67,000th of an inch.

Light travels at a constant speed of 186,000 miles a second. This would mean that in looking at violet for one second, some 800 trillion waves enter the eye to produce the sensation of this hue.

B. How We See Color

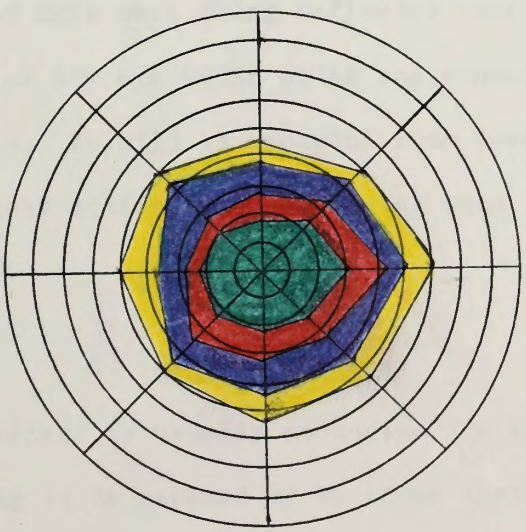
Now that we know something about the physical nature of color, something on the way color is seen is now in order. There are many theories of color vision, some mechanical, some electrical, some chemical. Here is a common theory. There are two types of nerve endings on the retina of the human eye. They are rods and cones, (See Diagram II, page 16). The rods, distributed mainly on the outer boundaries, give rise to sensations of brightness. The cones, concentrated in the center of the eye (called the Fovea), give rise to sensations of hue. When light strikes the eye, various things take

Diagram II.

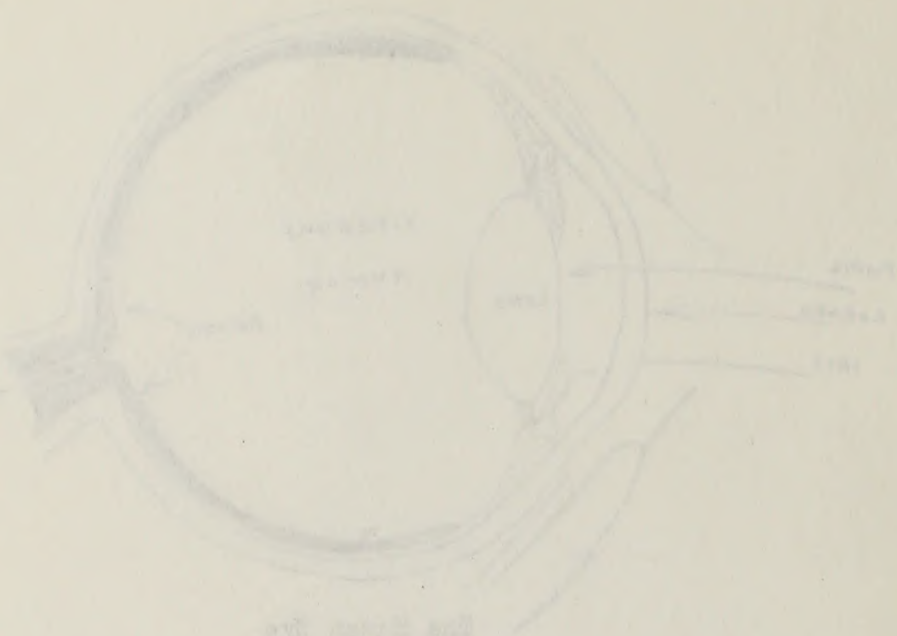


The Human Eye

Diagram III.



The Fields of Color Perception.



place. Electrical currents are produced in the optic nerve. Pigment granules in the retina may "migrate", the pigments hiding when darkness exists and coming up into the space between the rods and cones under the stimulation of light. Again, the cones themselves may contract under the influence of light, while the rods may swell. The visual purple, which floods the retina, will grow more acid under the stimulation of light, and it will also bleach out. [1]

The following is another way we see color. The color rays of luminous color and transmitted color come to the eye directly from the original light source. The rays of reflected color come to the eye by reflected light. The object is visible because light from some source falls upon it, and some rays of the light are absorbed and the balance reflected. In this case it is the reflected rays, only, which we see. As an example, if some light falls upon a red apple, it would indicate that the surface of the apple absorbs all the rays of the sun except red, and that the red rays were ebing reflected back. These red rays striking the retina of the eye would cause the sensation of red and we would see a red apple. It will be apparent from foregoing that the color of anything will appear differently, depending upon the rays contained in the illuminant. [2]

C. Color Blindness.

Color blindness is usually accounted for as visual short-coming and is nothing to be ashamed of by those that are color blind.

[1] Birren, Faber; Selling With Color, pg. 192.
[2] Outdoor Advertising Association of America, Inc.: Outdoor Advertising - The Modern Marketing Force, pg. 73.

The cones of the eye for some reason are inactive to certain radiant energy. Color blindness is of several types. Total color blindness is exceedingly rare, and is usually attended by a general deficiency in the perception of light and form. Inherited red-green blindness, the most prevalent type, is seldom accompanied by any other abnormalities. Persons who have it see detail and brightness with normal acuity; but among colors their perception is clear only to yellow and blue. Red and green look alike and are dull, brownish. Yellowish greens may resemble dull blue. A pure blue has considerably more brilliance than red or green.

Red-green blindness may be associated with shortening of visible part of the spectrum at the red end. To such observers (protanopes), red appears dark, almost black. Light red is confused with slightly darker gray and still darker blue-green. In the case of red-green blindness where there is the normal extent of visible spectrum (called deuteranopes), green is confused with yellowish gray and magenta (red-purple).

These types of color blindness are heritable and will follow laws of heridity. One compensation is that the afflicted person may have higher acuity in dim light, perhaps owing to a greater preponderance of rods in his eye. Women are spared, less than 1 per-cent of them having the defect. In white males, the per-centage runs about 4. The per-centage among Negroes is less than 3, among Indians, less than 2. These relatively few persons are obliged to make up for the deficiency by judging certain colors mainly in terms of value. [1]

[1] Birren, Faber, Selling With Color, pg. 193.

III. Color Systems.

A. Introduction.

Since the normal human eye can see many colors and the trained human eye can see anywhere from 7,500,000 to 10,000,000 colors, there must be some system of color designation. Today there are two major systems of color designation that are widely used and recognized in both America and Europe. These are the creations of Albert H. Munsell and Wilhelm Ostwald. There are also other systems that are recognized, but are not widely used. Among others are the ISCC-NBS method (Inter-Society Color Council - National Bureau of Standards) and the ICI system (International Commission on Illumination).

The Munsell and Ostwald systems are alike in several respects and should be known by anyone who uses colors to any extent. The two systems have these elements in common: (1) an orderly sequence of colors that plot the entire realm of visual color sensation; (2) a three-dimensional conception in which the general form of the solid comprises a white and a black apex, a neutral gray axis, pure hues about an equator, and intermediate scales of tints, shades, and tones in methodical arrangement; and (3) a method of color identification in which each individual tone within the solid is to be measured and noted.

B. Definitions.

Before going on into the discussion of the systems, a few definitions should be given so that one may better understand the systems.

Hue: Munsel defines it as "The quality by which we distinguish one color from another, as red from a yellow, a green, a blue, or a

purple." [1] Hue is divided into three subdivisions, as follows:

1. Primary hues that are not producible by mixture. Red, Yellow, and Blue.
2. Secondary hues that are produced by mixture of equal parts of two primary hues. Orange, Green, and Purple (or Violet).
3. Intermediate hues that are produced by mixture of unequal parts of two primary hues, or of one primary hue and one secondary hue. Yellow-Green, Green-Yellow, Blue-Green, Green-Blue, Purple-Blue, Blue-Purple, Red-Purple, Purple-Red, Orange-Red, Red-Orange, Yellow-Orange, and Orange-Yellow.

Value: Munsell defines it as "The quality by which we distinguish a light color from a dark one." [2] Value is subdivided into nine steps and is conceived as a vertical pole or axis. The steps and their names are as follows:

1. Dark or Black.
2. Low Dark.
3. Middle Dark.
4. High Dark.
5. Middle Value (Neutral Gray).
6. Low Light.
7. Middle Light.

[1] A Grammer of Color, pg. 14.
[2] Ibid, pg. 15.

8. High Light.

9. Light or White.

(Note: When in use as a pole or axis the scale has black at the bottom of the pole or axis and white is at the top. The Munsell value scale has nine steps and black and white. Black is numbered 0 and white is numbered 10.)

Chroma: It is the quality by which we distinguish strong from weak colors. Each hue varies in chroma strength. Chroma is measured from neutral gray outward. Pure, full-strength red is 14 steps away (at value 4 only), since red is the strongest color and having the greatest number of steps of chroms.

Color Triangle: It is the conception of the sensations of seeing color. (See Chart I, page 22)

Tint: The addition of white to a color.

Shade: The addition of black to a color.

Gray: The combination of white and black.

White: The combination of all colors.

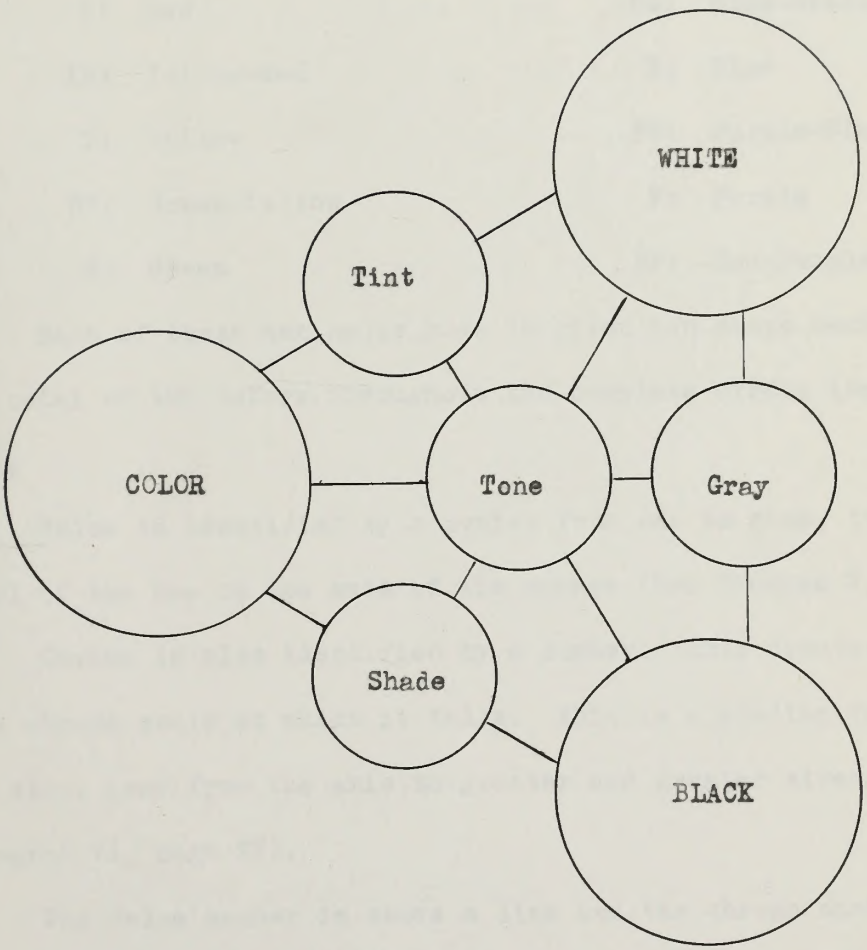
Black: The absence of all colors.

Tone: The combination of white and black to a color.

C. The Munsell Color System.

The Munsell color system is based on three dimensions of color; hue, value, and chroma. Because of this the Munsell color solid follows the general shape of a sphere. Because each hue varies in chroma strength, the solid is not a perfect sphere (See Diagram VII, page 26). The three dimensions are measured in the following manner: hue is measurement

Table I.



The Color Triangle



around a circle; value is measurement up a vertical pole (the axis of the sphere); chroma is measurement on a horizontal away from a vertical pole or axis.

Hue is identified in the system by a letter, as follows:

R:	Red	BG:	Blue-Green
YR:	Yellow-Red	B:	Blue
Y:	Yellow	PB:	Purple-Blue
GY:	Green-Yellow	P:	Purple
G:	Green	RP:	Red-Purple

Each of these ten major hues is given ten steps each. This makes a total of 100 colors throughout the complete circle (See Diagram IV, page 25).

Value is identified by a number from one to nine, to indicate the level of the hue on the axis of the sphere (See Diagram V, page 26).

Chroma is also identified by a number. This denotes the step upon the chroma scale at which it falls. This is a grading from gray, step by step, away from the axis to greater and greater strength of color (See Diagram VI, page 27).

The value number is above a line and the chroma number is below the line. Example: R2/6 is the Munsell symbol for the color generally known as Maroon. The hue is red with a value of two and a chroma strength of six. To further identify a color, a number is sometimes placed before the hue symbolic letter to indicate its exact location on the Munsell color circle. Example: 5R 2/6. This is about halfway between red-purple and yellow-red in the red hue. The value of two is only two steps from black, so it is like a dark gray. The chroma is six steps

removed from the axis of gray, so it is strong in chroma.

Because colors differ by nature in their chroma strength (some being much more powerful than others), and that all colors do not reach their maximum chroma strength at the same level of value, it is evident that a complete image of all pigment colors cannot be comprised within the sphere; so Munsell conceived the Color Tree. This tells more completely the character of color qualities and dimensions governing the range of pigments in regular use.

The vertical trunk of the tree, (See Diagram IX, page 30), is the scale of value and the branches represent the different hues. These branches vary in length with the chroma strength of each hue. The leaves of the tree represent the measured steps of chroma upon each branch.

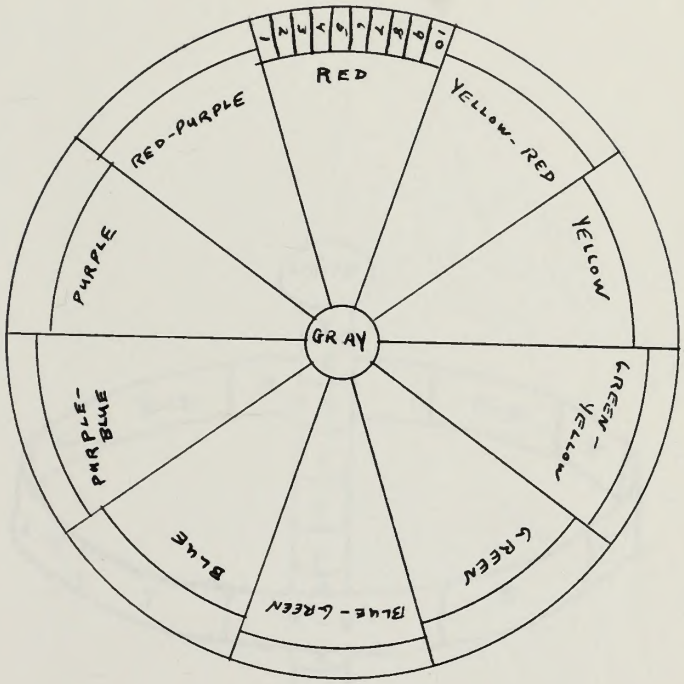
The number of steps on the chroma scale is limited only by the strength of the pigments. As new and more powerful pigments may be discovered, they will add further steps to the scale of chroma. Red started out with only ten steps and now has fourteen steps.

D. The Ostwald Color System.

We have just seen how the most widely used color system in this country uses hue, value, and chroma as its dimensions. The Ostwald system recognizes that every color seen by the eye is comprised of proportions of hue, white, and black, and that all such elements are measurable.

The Ostwald solid is in the form of a double cone (See Diagram XI, page 33). The color circle, (See Diagram X, page 32), at

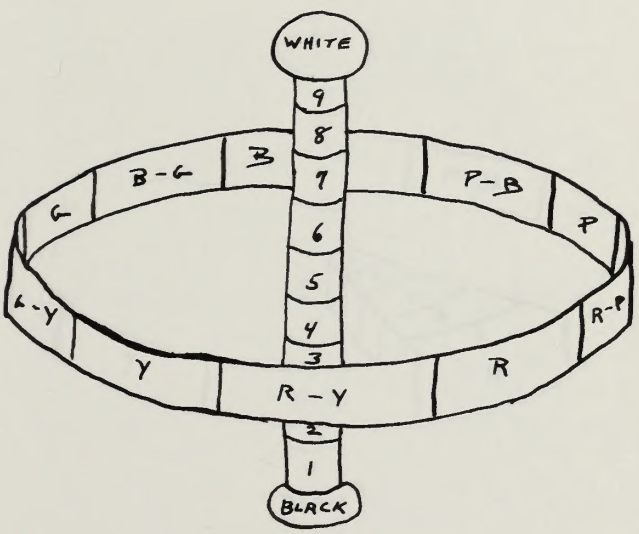
Diagram IV.



The Munsell Color Circle.



Diagram V.

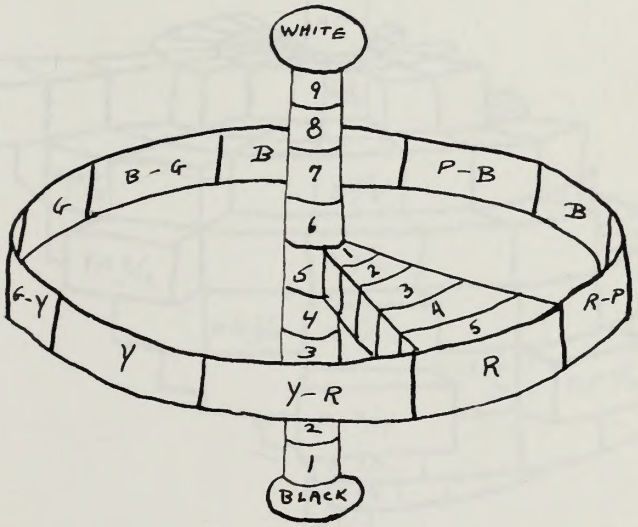


The Value Axis Combined With The Color Circle.

(At The Middle Value)



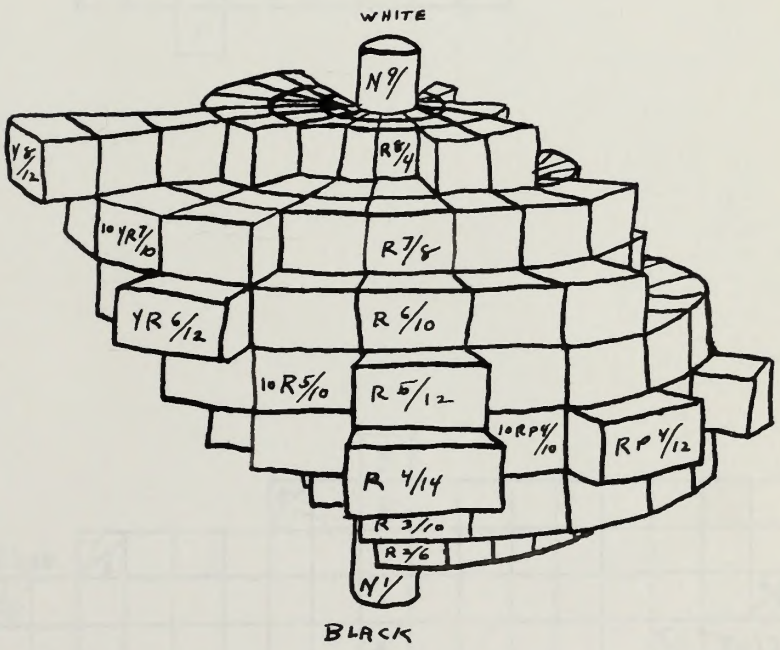
Diagram VI.



The Completed Sphere Showing R 5/5.



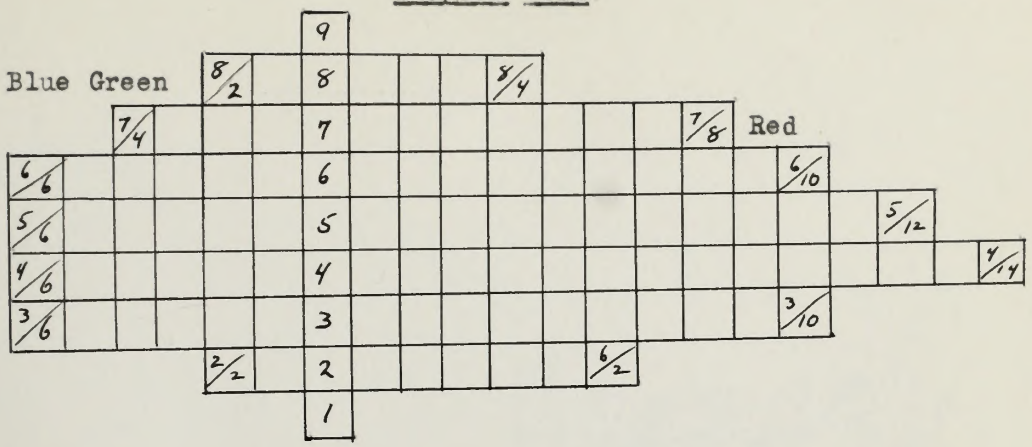
Diagram VII.

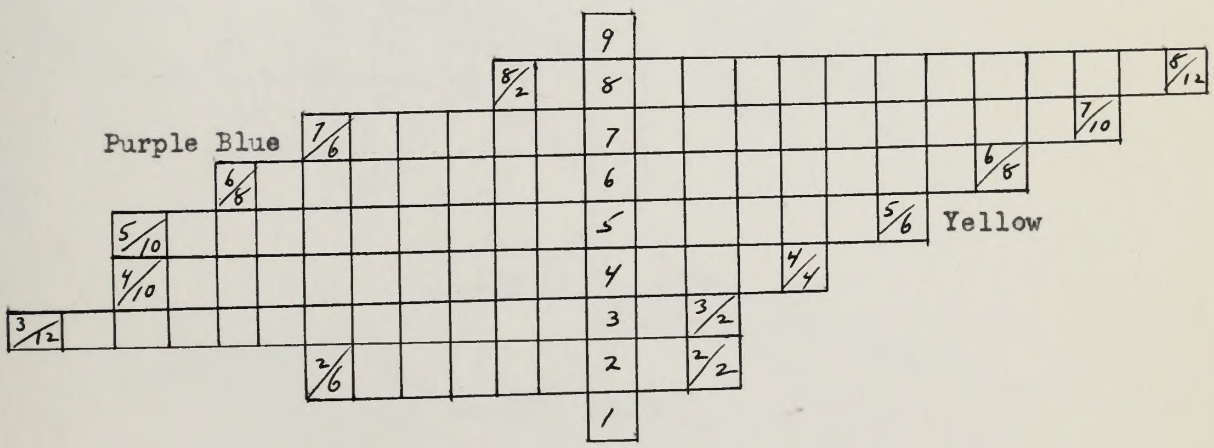


The Munsell Color Solid.

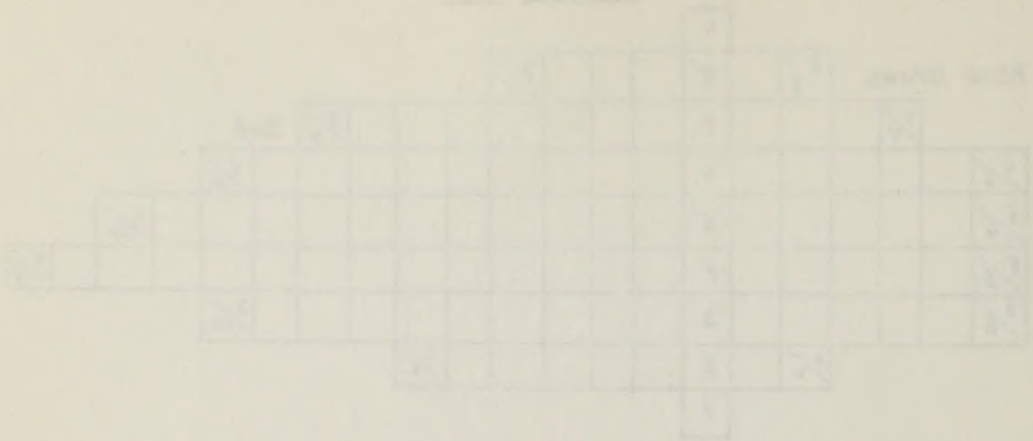


Diagram VIII.





Sections of The Munsell Color Solid.



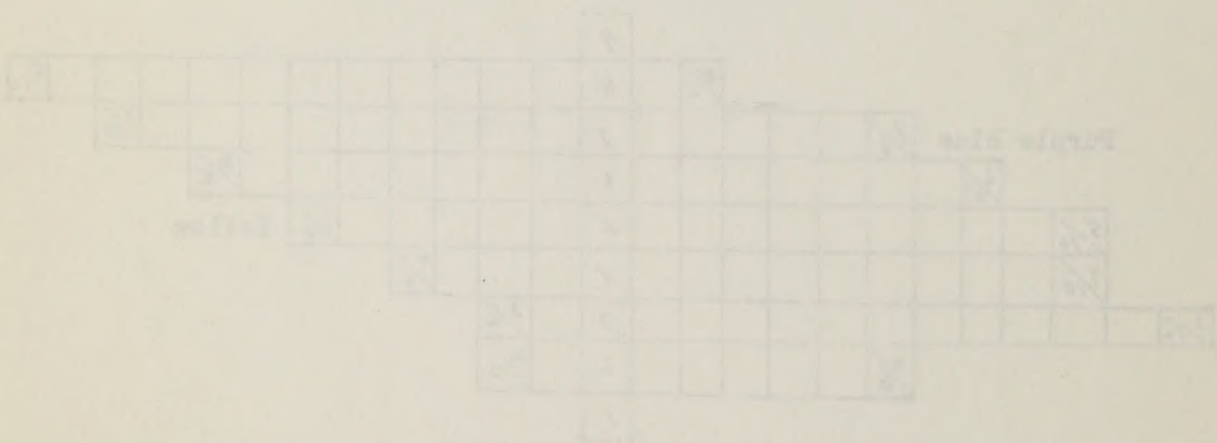
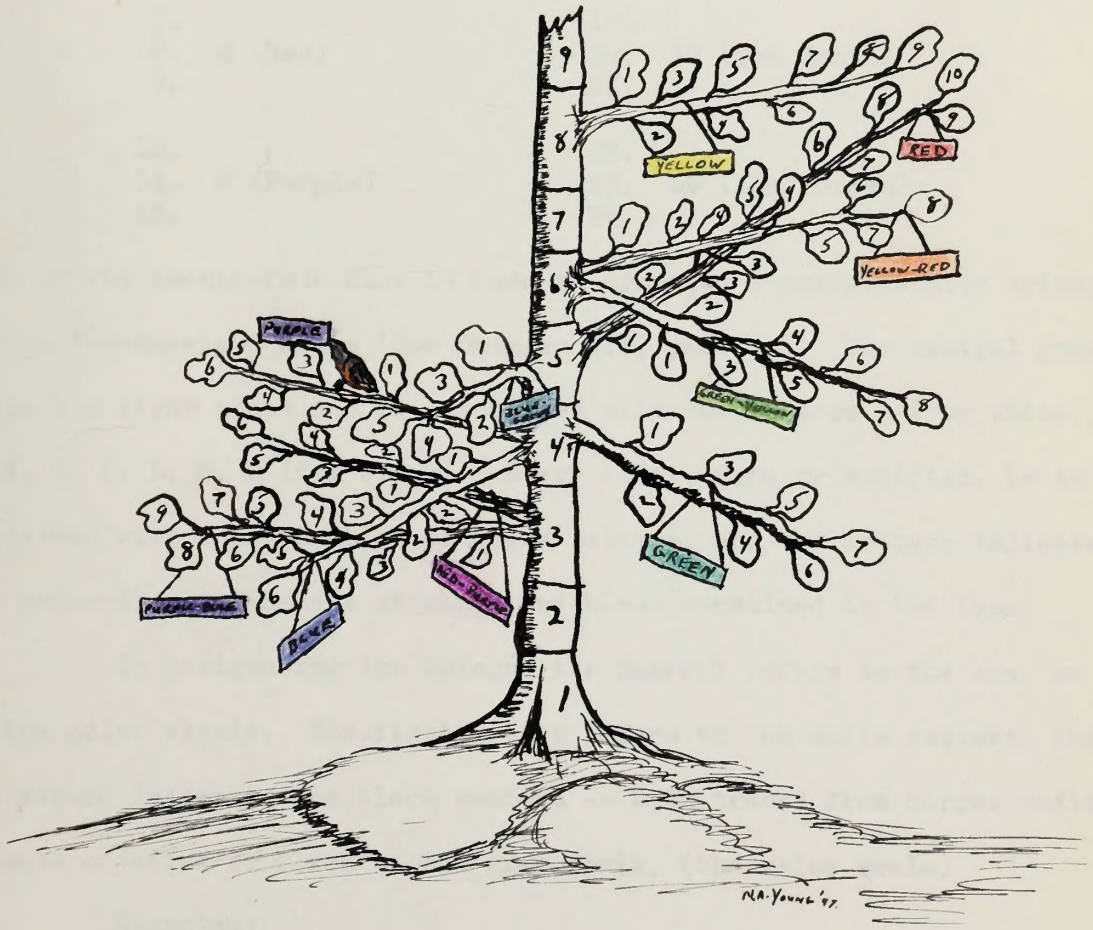


Diagram IX.



The Cleland Color Tree.

(Based on The Munsell System as of 1921)



the circumference, is made up of twenty-four hues, which are designated with numbers and letters, as follows:

1.		13.	
2.	Y (Yellow)	14.	UB (Ultramarine Blue)
3.		15.	
4.		16.	
5.	O (Orange)	17.	T (Turquoise)
6.		18.	
7.		19.	
8.	R (Red)	20.	SG (Sea Green)
9.		21.	
10.		22.	
11.	P (Purple)	23.	LG (Leaf Green)
12.		24.	

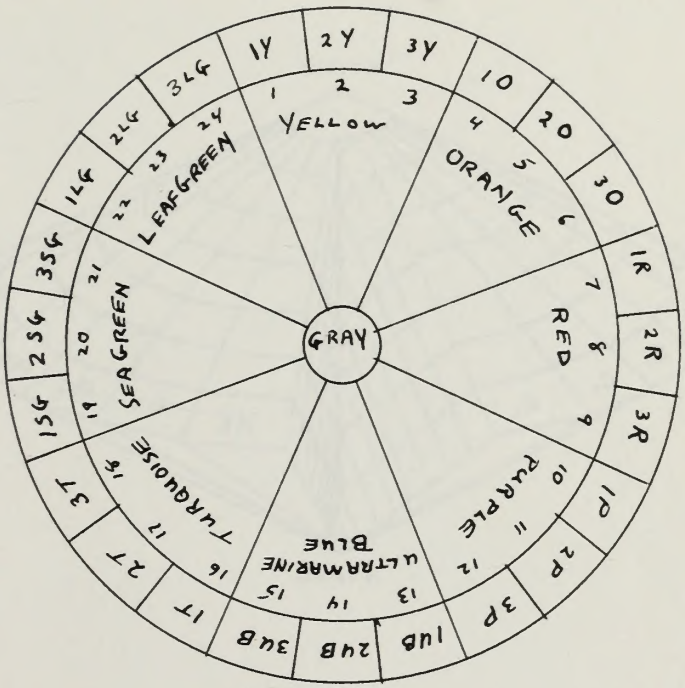
Each of the twenty-four hues is made to comprise a monochromatic triangle having twenty-eight tones (See Diagram XII, page 34). The neutral gray scale has eight steps and is identified with the letters A (for white), C, E, G, I, L, N, P (for black). Every color, pure or modified, is to be described with a combination of these letters, and the letters indicate the proportionate amounts of white and black contained in the tone.

In designating the colors, the numeral refers to the hue, as on the color circle. The first letter refers to the white content, and the second letter to the black content -- both traced from corresponding amounts of white or black on the gray scale, (the value scale).

Examples:

8 pa: This would be a relatively pure red. The letter p (black), indicating an absence of white in the mixture, and the second letter, a (white), indicating an absence of black.

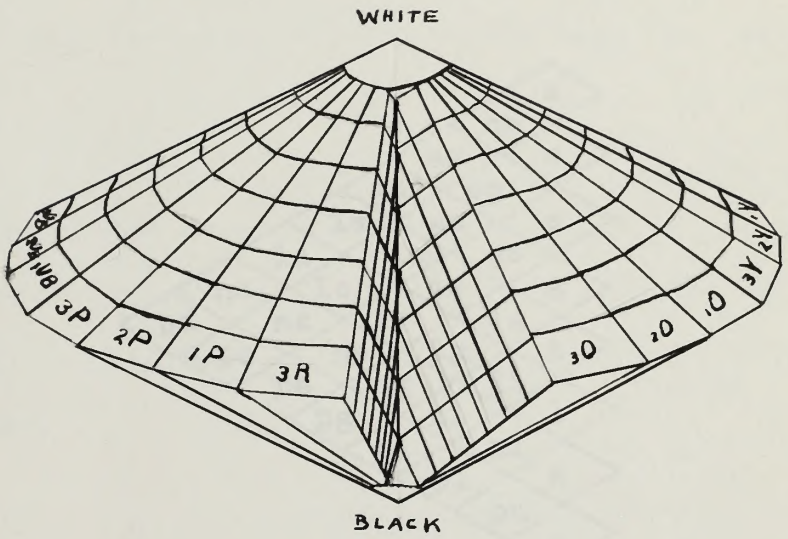
Diagram X.



The Ostwald Color Circle.



Diagram XI.



The Ostwald Color Solid.

(First and second Red section removed.)

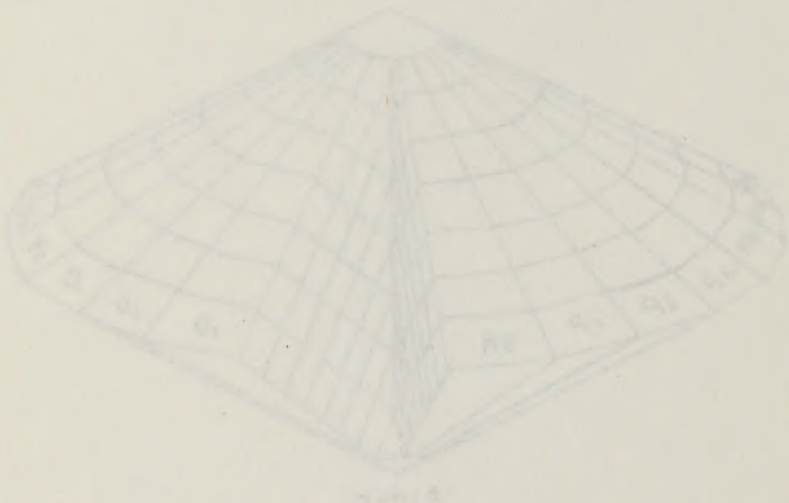
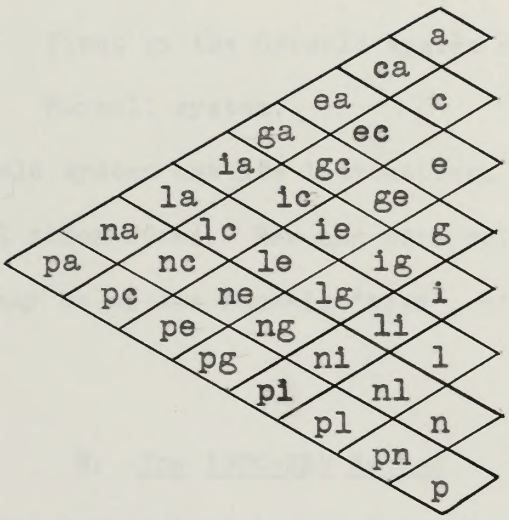


Diagram XII.



Section of The Ostwald Color Solid.



2 pi: This would be a deep yellow or olive, the first letter, p, indicating an absence of white, and the second letter, i, a slight amount of black. The same tone would be designated in the Munsell system with the following notations: Y 3/2.

12 ea: and 10 PB 7/6 stand for the same tone, lavender. The first by the Ostwald system and the second by the Munsell system.

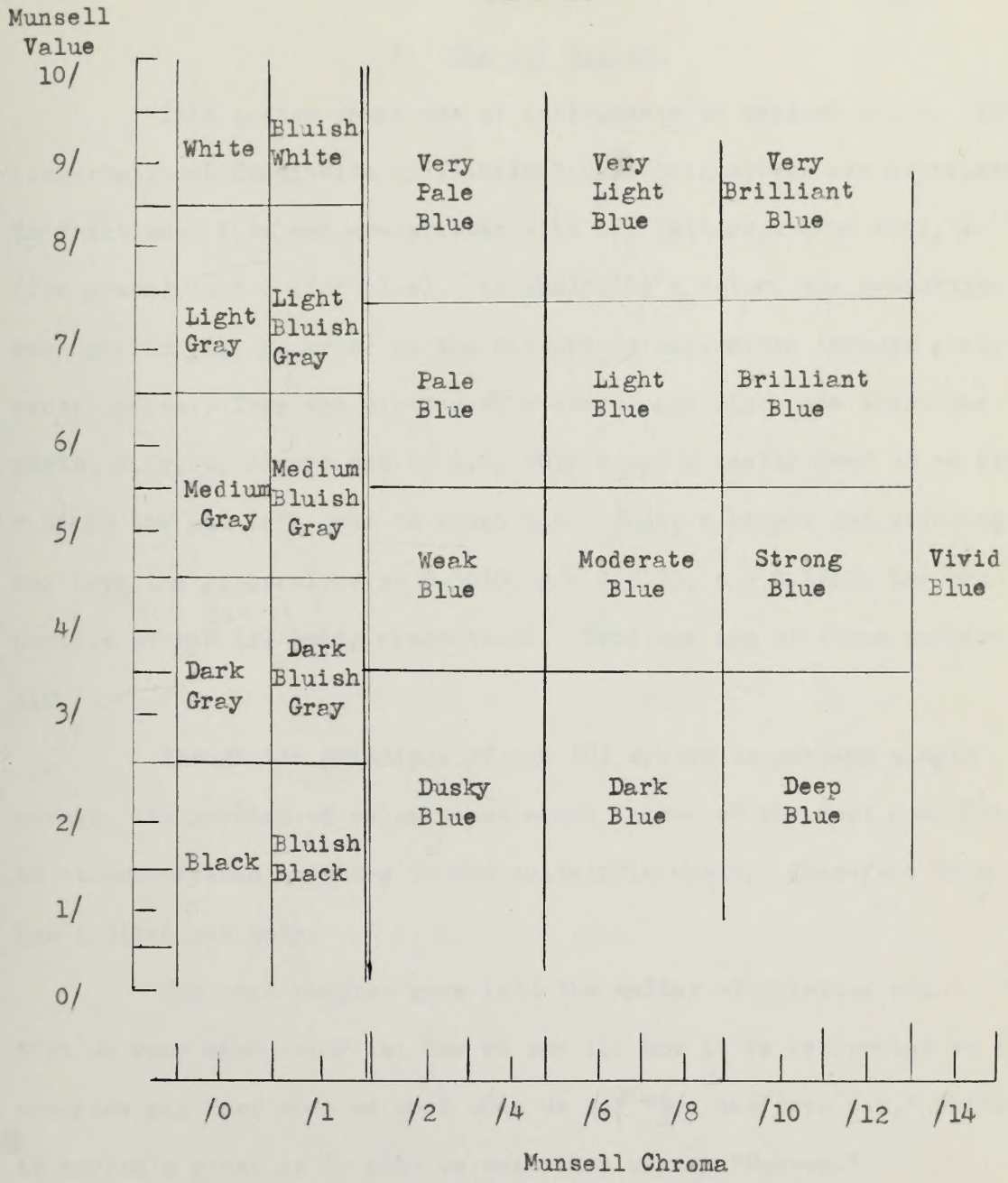
The Ostwald system has its limitations. The end points, for example, are at all times fixed. New and more brilliant chromas cannot be added, as they may be on the Munsell "tree", without reforming the entire scheme.

E. The ISCC-NBS Method.

This system was devised by the Inter-Society Color Council and the National Bureau of Standards for the description of color of drugs and chemicals to be used by the United States Pharmacopoeia. The system is based upon a meaningful use of words. All but very grayish colors are described by hue names, (red, green, blue, purple, etc.). proceeded by modifiers, such as pale, light, brilliant; weak, moderate, strong, vivid; dusky, deep, dark, (pale blue, moderate blue, strong blue, deep blue, etc.). For very grayish colors, hue names become modifiers of white, gray, or black, (bluish white, medium bluish gray, bluish black, etc.).

It is possible to write fairly intelligible descriptions of colors by this means. The Munsell system has been completely translated into ISCC-NBS terms. Chart II, page 36, shows ISCC-NBS terms as applied

Chart II.



The Munsell Color Chart of Blue Translated into ISCC-NBS Terms

to a Munsell color chart for blue.

F. The ICI System.

This system makes use of instruments to measure color. ICI (International Commission on Illumination) designations are expressed in fractional form and are written with the letters x (for red), y (for green), and z (for blue). In analyzing a color, the proportion of each primary (x, y, or z) in the mixture is determined through instrumental means. They are plotted on a chart, and since the fractional parts, x, y, z, always add to 1.0, only x and y really need to be plotted, z being the sum left over to equal 1.0. Thus, a bright red printing ink may have the proportions x- 0.5610, y - 0.3175, z - 0.1215; the proportion of red (x) being predominant. Note the sum of these numbers is 1.0.

Though the principle of the ICI system is perhaps simplr enough, the problem of color measurement is one of the most complicated to be encountered anywhere in the scientific world. Therefore this system has limited use only.

The next chapter goes into the matter of printing color. Now that we know what color is; how we see it; how it is designated so that everyone may know what we mean when we say "Red two over six," while it is anyone's guess as to what we mean when we say "Maroon."

IV. Methods of Color Reproduction

A. Introduction

Before discussing the methods of color reproduction, a word on the methods of printing. There are three basic methods of printing: letterpress, lithography, and intaglio. Letterpress is printing from a raised surface which gives the process the alternate name of relief printing. This printing is done by type, line plate, halftones, or combinations of the three.

Lithography is printing from a flat surface which gives the process the alternate name of planographic printing. This printing is done from smooth stone or thin metal plates with some parts of the surface prepared so that it will refuse to take ink, while others will attract ink. Offset is another form of this method.

The third basic method, intaglio, (pronounced "intalyo"), is printing from a depressed surface. This printing is done from plates that have small holes, cups, or depressions engraved into them. Rotogravure and photogravure are forms of intaglio printing.

B. Letterpress

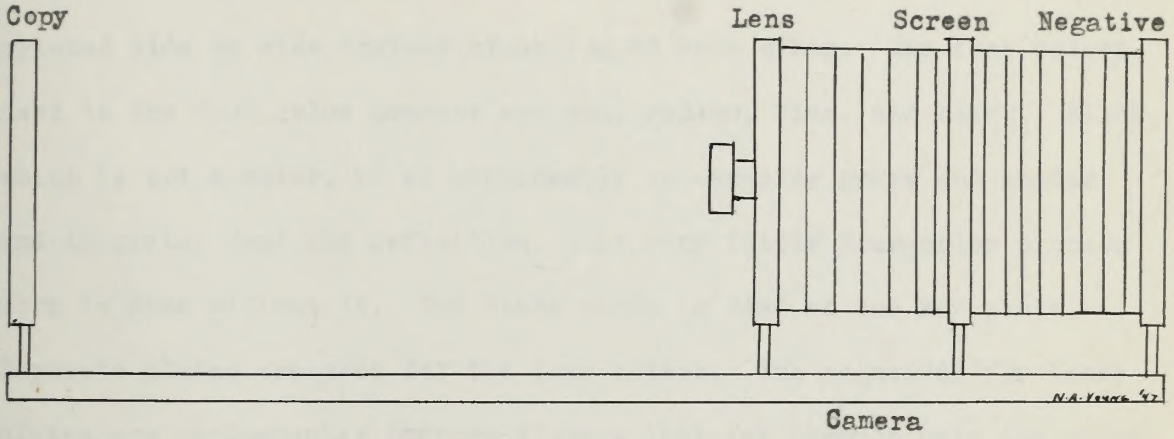
Color reproduction by letterpress produces advertisements of one, two, three, four, or more colors. One-color advertisements are the most simple to reproduce, since all that is needed is one plate and the fountain of the press filled with the desired color. But as the number of colors increases, the process becomes more and more complicated. Two-color advertisements require two separate plates. These may be line or halftone plates. The making of these plates is a complicated matter and

is well described in Thomas B. Stanley's book "The Technique of Advertising Production", pages 82 to 85 for line plates and pages 88 to 94 for halftone plates.

Line plates reproduce solid blocks of colors. Therefore, when printing two colors, a third may be had by overlapping or of printing one primary color over another primary color. This would give a secondary hue. Example, red printed over yellow would give orange, or yellow over blue would result in green. Care must be taken in planning to have the over-printing color of a transparent ink, while the base ink is an opaque. If this care is taken, the resulting secondary hue will be pure and brilliant. If the second ink or overprinted ink is opaque, then the secondary hue will be dull and muddy. As can be seen, a three color advertisement can be printed from two line plates by the use of over-printing. In like manner, four color advertisements may be printed from three line plates. Six color advertisements are also possible from the use of only three plates, for the three primary hues will give three secondary hues; red and yellow give orange, yellow and blue give green, and red and blue give violet.

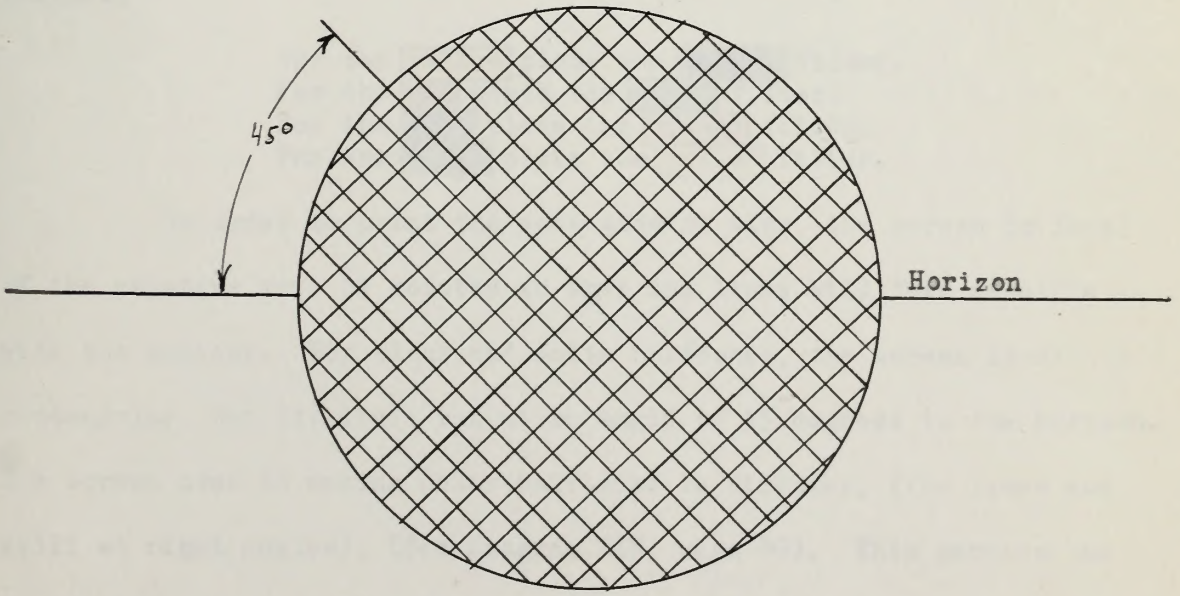
In the making of the halftone plates, a photograph is taken to make a negative from which the plate is made. In front of the negative plate in the camera is placed a screen, which is called a halftone screen (See diagrams XIII and XIV, page 40). This screen is made of glass, that has been ruled with two sets of parallel black lines. These two sets of parallel lines are at right angles to each other so that the glass, when looked through, has many squares ruled on its surface. When the negative is developed, the picture on it is broken up with many small squares or

Diagram XIII.



Showing Relation of Halftone Screen to Copy, Lens, and Negative.

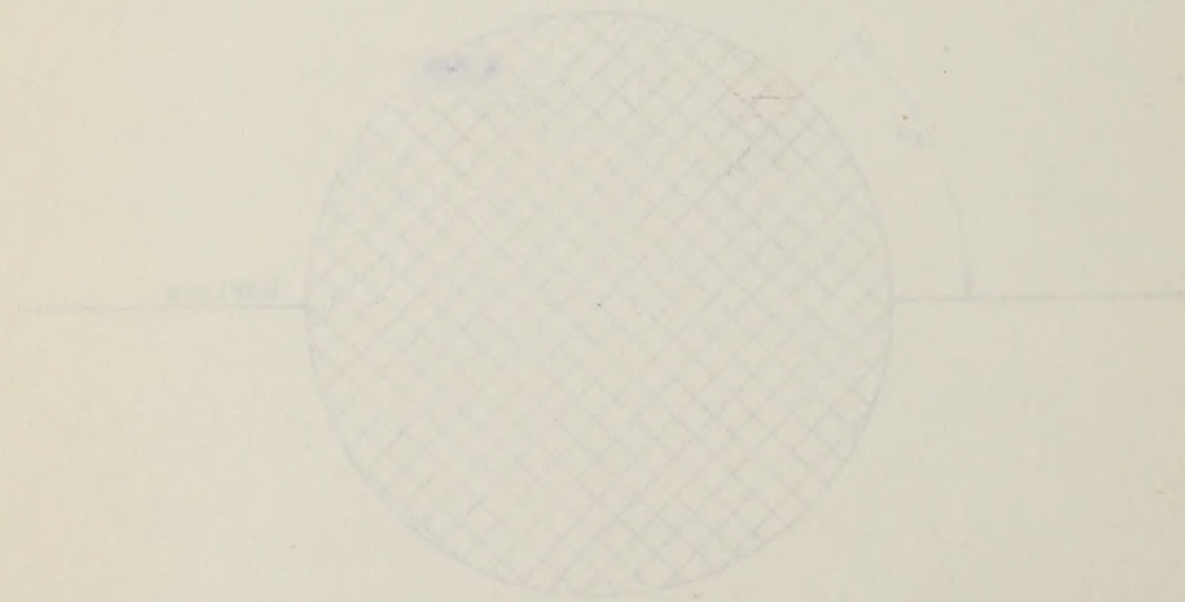
Diagram XIV.



Color Halftone Screen.

(Not in Proportion)





dots produced by the halftone screen.

Halftone plates, for color printing, must be made from separate negatives for each color of ink used. Since the eye mixes dots of primary color into secondary hues, the color dots must, so far as possible, be printed side by side instead of on top of each other. The four colors used in the four-color process are red, yellow, blue, and black. Black, which is not a color, is so serviceable in securing grays and shades, and in giving dept and definition, that very little four-color process work is done without it. The black plate is used as the key plate. Separate plates are made for the four colors. The negatives for these plates are photographes through filters that let through only the color desired, and stops all other colors from passing through the filter. The color of the filter and the color plate for which it is used are as follows:

For the yellow plate the violet filter.
For the red plate the green filter.
For the blue plate the orange filter.
For the black plate the yellow filter.

In order to print the dots side by side, the screen in front of the negative must be rotated so that the lines will form an angle with the horizon. For black and white halftones, the screen itself is rectangular, but its lines run at an angle of 45 degrees to the horizon. The screen used in making color halftones is circular, (the lines are still at right angles), (See Diagram XIV, page 40). This permits the screen to be turned, like a wheel, so that the lines may be brought to any desired angle with the horizon. Since the 45 degree angle is the least obtrusive, it is saved for the darkest color, black. Since yellow

dots are the hardest to see on white paper, the most obtrusive angle, 90 degrees, is very often saved for the yellow. The plate maker will use various arrangements of angles to meet the problem on hand, but the following is the most common setting used in four color process plates;

Black set at 45 degrees.
Yellow set at 60 degrees.
Red set at 75 degrees.
Blue set at 105 degrees.

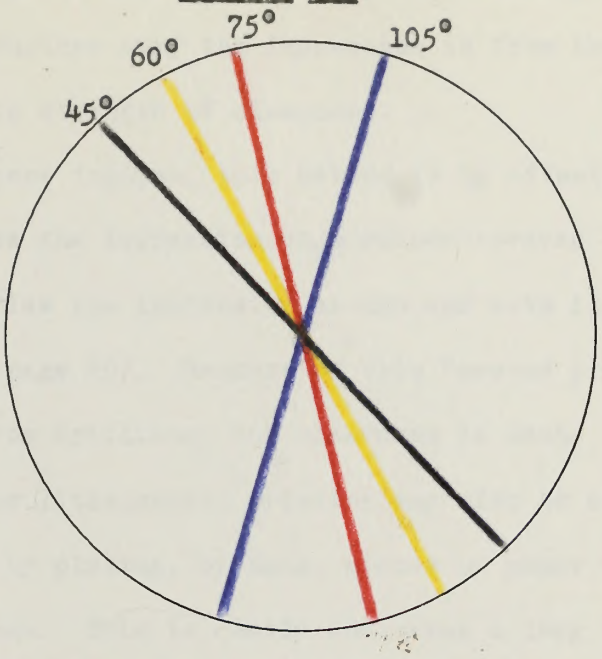
(See Diagram XVA, B page 43).

In printing the advertisements, the following order of printing the colors is used: yellow, red, blue, and black. However, this order of printing is not always followed, some printers use the following order: black, blue, red, and yellow. As a rule, these are the only two combinations used in four-color process work. It will be noted that the secondary hues in line plates and halftone letterpress printing are secured by two different mixing methods; the line plate mixing is by overprinting and the halftone mixing is by visual impression, due to the printing of dots side by side and to the fact that the dots are too small to be seen separately.

C. Lithography

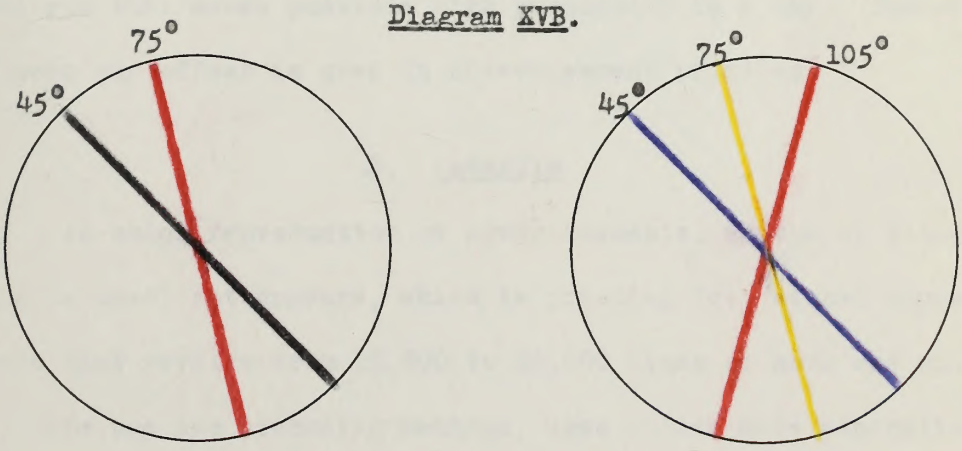
Reproducing colored advertisements by lithography is common with letterpress process using halftone plates, for both separate colors by filters and print the color dots side by side, relying on variation in dot size to reproduce different color strengths. Lithography has two characteristics that are different from letterpress. They are its rubber-covered offsetting cylinder and its planographic plates. This method of printing requires a plate for each color printed, but its final impression

Diagram XVA.



Screen Angles for Four Colors

Diagram XVB.



Screen Angles for Two and Three Colors





is likely to be weak because of the method of printing. As a general rule, in printing, the further away the impression is from the original plate, the weaker it is in strength of clearness.

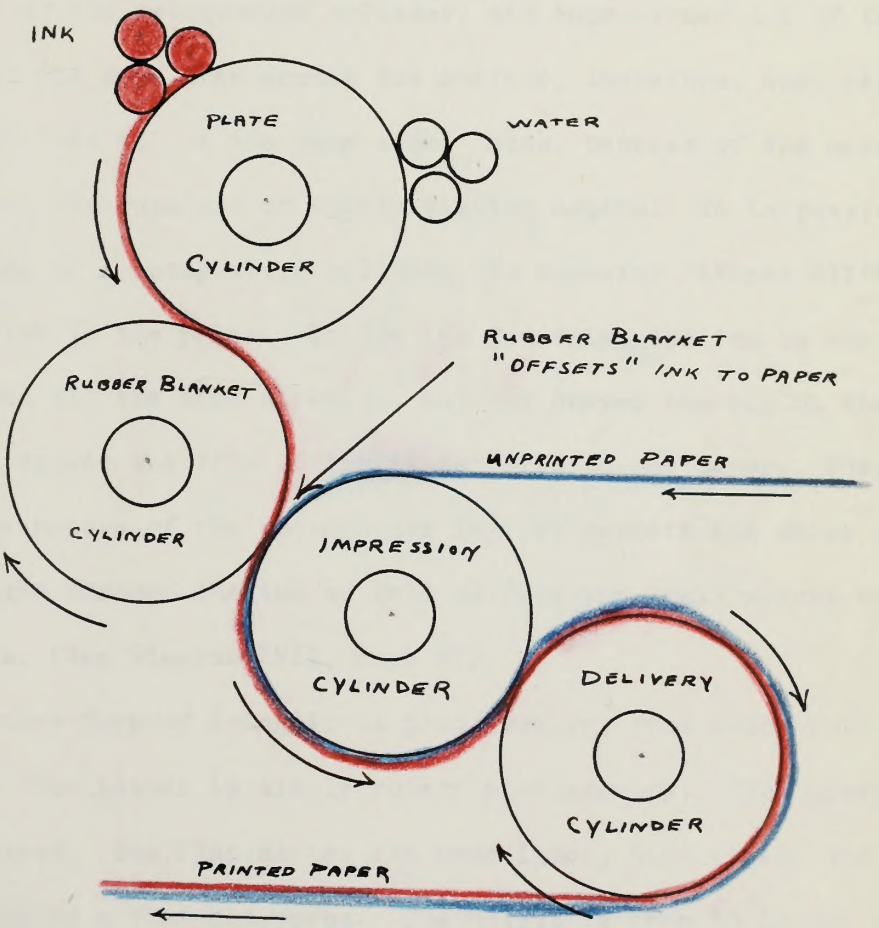
As the name implies, this method is by offset, that is the plate is inked and leaves the impression on a rubber-covered cylinder. This cylinder then carries the impression around and sets it off onto the paper. (See Diagram XVI, page 45). Because of this "second printing" or off-setting, some of the brilliancy and clearness is lost.

One color lithographic printing may also be done by the direct method. That is, by placing, by hand, pieces of paper against a flat lithographer's stone. This is costly and takes a long time, with low production. Compare this with the thin metal plates used in offset and the fast run that makes possible high production in a day. Thereby it is easily seen why offset is used in advertisement printing.

D. Intaglio

In color reproduction of advertisements, a form of intaglio printing is used; rotogravure, which is printing from etched copper cylinders that revolve from 15,000 to 20,000 times an hour and up. This method, like the two preceding methods, uses filter-made separation negatives to split the colors of the copy into approximately the three major hues of the color spectrum, and a separate printing cylinder or plate for each of the colors of ink used. Color rotogravure differs in certain essential respect when compared with color-printing in relief. These differences grow out of basic distinctions between the two methods. As stated above, the mixing of the colors is done by the eye when looking

Diagram XVI.



One Color Offset Lithography Printing.



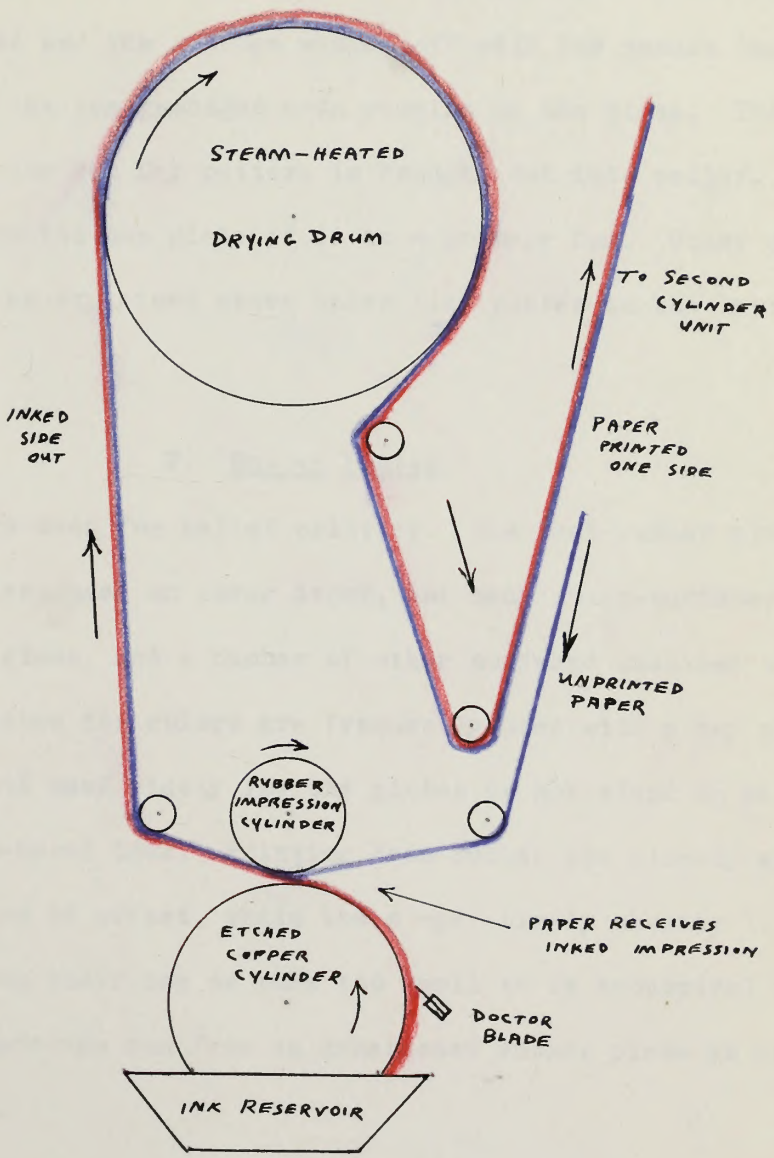
at halftone four-color printing. Halftone plates print colors only in one strength; the full strength of the inks being used. An illusion of strength variations is created by varying the dot size in relation to white paper, and the reciprocal effect of neighboring dots of other colors. In the making of the rotogravure cylinder, the cups etched out of the copper are all the same area across the surface, therefore, when printing they leave ink dots all of the same size. Also, because of the nature of the process, the cups are of widely varying depths. It is possible, from one inking of a rotogravure cylinder, to transfer fifteen different densities of ink to the paper. In the ink fountain, the ink is all the same color, and all the same strength; but the deeper the cup on the cylinder, the denser the film of ink it deposits on the paper. Then, because of the nature of the rotogravure ink, it permits the white paper to reflect light through the ink as well as from the small spaces between the color dots, (See Diagram XVII, page 47).

Another form of intaglio is photogravure, from which rotogravure came. The latter is simply rotary photogravure. Photogravure is a hand process. Its flat plates are hand inked, hand wiped, and printed by hand on a flat-bed press. The output is from 50 to 500 prints a day, so it is easily seen that this process would not be used very often in advertising.

E. Ben Day

This is a method of laying a tint on a line plate. A photograph is taken of the copy, a negative made, the image is stained onto metal. The engraver takes a water-soluble gum solution called "gamboge",

Diagram XVII.



One Color Rotogravure Printing.



and with it paints over all the area that is not to receive Ben Day treatment. When this dries, a screen or gelatin film is inked and placed over the plate, rubbed and the greasy ink is transferred to the plate. The plate is washed and the gamboge washes off with the result that only the greasy ink on the non-gamboged area remains on the plate. The plate is now etched and the Ben Day pattern is brought out into relief. Each color would require its own plate if it is a primary hue. Other colors can be reproduced as explained above under line plates in the letterpress section.

F. Rubber Plates

These are used for relief printing. The best rubber plate work is in line. They are used on cover stock, and many rough-surfaced papers, as well as cloth, glass, and a number of other surfaced unsuited to metal plates. Rubber plates for colors are frequently used with a key plate in metal. They are not used widely for the plates do not stand up well under the effects of oil-based inks. Printing from rubber can closely approximate the effect of offset, while the comparatively shorter life of rubber plates allows their use on runs too small to be economical in lithography. The average run from an unhardened rubber plate is around 25,000 impressions.

G. The Silk Screen Process

This method is also applicable to a large number of surfaces unsuited to conventional printing methods. The screen is, unlike other screens mentioned above, a piece of silkthread, open mesh, bolting cloth, like cheesecloth. The screen is stretched on a frame. The cloth is cut

with the design to be printed. The screen is laid over the surface to be printed on, then thick paint is applied to the cloth screen with a rubber squeegee which forces the color through wherever the design has left the mesh open. A separate screen is needed for every color used, except for a few special exceptions. This knife-cut is fastened to the underside of the screen with adhesive to keep paint from getting through where the design does not call for it.

The next chapter will take up Color in Printed Media Layout in which is discussed which of the above methods are best used in each media.

V. Color in Printed Media Layout.

A. Introduction.

When using color in advertising, the media to be used must be considered when choosing colors. Each media presents its own problems to the advertiser. Not the least of the problems is the problem of whether the media will accept colored advertisements. Not all media handle colored advertisements for the simple reason that they do not have the equipment and/or the personnel to handle such copy. The finest set of plates may be had for your advertisement, but if the press work is not of the finest, then your advertisement will lose all its fineness when reproduced. The Standard Rate and Data books should be checked for mechanical requirements before ordering plates.

B. Magazines.

Magazines offer the advertiser a widespread national circulation. This is their chief advantage over newspapers whose circulation, while it is more intense, is restricted to certain areas. In many cases where the advertising appropriation is not large enough to use local media in all the markets in which the product is sold, manufacturers whose products have nationwide distribution advertise in magazines with national circulation to promote the sale of their products effectively and economically throughout the country. By the use of magazines, they buy national coverage and thereby secure advertising representation in all of the possible markets.

After the advertiser has decided that he will use magazines in his campaign, he must then make up his mind whether his advertisement

will be in black and white or in color, for a black and white advertisement may prove to be twice as productive if color is used. The Armstrong Cork Company uses color (and has used it for twenty-five years) because their product, linoleum, is made in many colors. To visualize the product and its use, typical home scenes are used. Black and white would not give these scenes a sufficiently realistic setting; hence the extra premium rate for color is willingly paid by the advertiser for the opportunity of making his advertising more realistic. Of course not all products are so well adapted to the use of color as the Armstrong Cork Company's product; but all companies can use color in their advertisements provided they use them with care.

A four-color magazine page advertisement costs approximately 45 per-cent more than an ordinary black and white page, although the cost varies from magazine to magazine. For example, the color rate for class magazines is about 55 per-cent more than the black and white; for general weeklies, it is 49 per-cent; and for women's service, it is 34 per-cent.

Magazines make use of the three basic methods of printing. The majority of them use the rotary letterpress, so that the publishers will require, as a rule, 120 line screen halftone plates. The comic magazines use rotogravure so that all that is needed is a good drawing of the advertisement and they make up their own plates. The Standard Rate and Data Service publication for magazines gives all the necessary information needed by the advertiser.

C. Newspapers.

Color in newspapers is a comparatively recent development. Several factors have operated to retard the use of color in newspaper advertising. The first, and perhaps the chief, deterrent has been the fact that color printing, to be high effective, requires smooth paper. Smooth or coated paper is too costly for newspaper use, except in magazine and rotogravure sections, and is not suitable for high-speed printing presses that many newspapers employ. The colored inks thus far available for high-speed printing on course newsprint paper have not proved very satisfactory, although there have been many recent experiments and improvements made. Because of the above reason, the degree of faithfulness of colors of merchandise when reproduced in newspapers is so unreliable, that advertisers do not like to risk the use of color in newspaper advertising.

The second difficulty has been the inexperience of newspaper engravers with color printing. Engravers of great skill are needed to prepare the plates from which colored advertisements are run.

The third drawback is the amount of time required. The advertisement of more than one color has to be run through the press once for each color, making a process that is slow and expensive.

The fourth drawback is the expense. Most advertisers in newspapers are the local retail merchants and they can not pay the high prices that are called for when colored newspaper advertising is desired.

The Boston Herald-Traveler Corporation just developed a new machine to aid the color in newspaper problem. This machine will insert in register at any press speed, preprinted flat sheets of high quality

color reproduction by any process on any grade of paper. The machine delivers the flat, single or folded, sheet of color reproduction to the web with no loss of press speed. The insert can be on any part of a newspaper page and is attached to the newspaper so that it does not fall out when the paper is unfolded.

The Newspaper Advertising Executives Association, Inc., felt that the problem was serious enough to appoint a committee on color advertising to look into the problem. They just put out a report called "Color Hits The Spot". The following quotation is from pages one and two of the report.

> "This is the age of color! Your readers, through long association with advertising in national magazines, direct mail, and billboards, have come to expect and demand color in their newspaper advertising. After all, newspapers have been undergoing an evolution for years. All of us can remember when newspapers advertising departments subscribed to several mat services and this was about all their advertisers expected. The merchandise was illustrated with an illustration "almost" like the actual goods. Later on retailers began to use the term 'exactly as sketched' under their illustrations to show that they really had the goods advertised. Today almost every retail store of any size has its own artist or staff of artists to reproduce illustrations picturing the goods they have for sale. The public expects this service and takes for granted the fact that they will find the goods 'exactly as sketched' when they go into the store to shop.
>
> "From this 'exactly as sketched' stage, it was an easy step into color. Products that would lend themselves to color reproduction were illustrated in color. Results showed the wisdom of this move. More about those results later, but right now let's look into the background of this demand for color.
>
> "Back in the nineties, according to Jerry Byrnes, promotion manager of the Chicago Tribune, color was first used in newspapers as a device to stimulate reader interest and to increase circulation. After some trials, it was almost abandoned, except for comic section use, until after the first World War. Improvement in dyes and general mechanics during wartime, plus the large amount of money appropriated by advertisers, gave new impetus to color.

Newspapers cast longing eyes on the color revenue of the magazine.

"Publishers expanded their facilities and were in a stronger position to bid for the increasing volume of color advertising which had been flowing into the magazines. A peak of $83,900,000 in color advertising was reached by the magazines in 1930. This volume was slashed by the depression but it made a comeback later and is still climbing in spite of the premium rate. However, despite this lesson from the national magazines and despite a very substantial growth during the last years, newspaper color facilities are limited. Only about 400 newspapers in the United States offer color to advertisers. Why all the fuss over 'Color Advertising in Newspapers' anyhow? Well, all we know is what we read in the results of questionnaires sent to numerous advertisers and agency executives and some of the things we have learned are included here for your attention.

"Color gets attention, and it makes for longer memory retention. It has the value of change of pace. It has the value of newness. Why does color do this? Just a glance and the nerves are stimulated . . . the greater the stimulation, the greater the impression. Studies have been made to prove this. In a recent questionnaire, leading newspapers gave the following reasons for using color:

23.7 per-cent, said attention value.
27.1 per-cent, color value in the product and package.
12.7 per-cent, psychological appeal of color.
12.7 per-cent, quality atmosphere around product.
10.3 per-cent, color values in showing use.
9.3 per-cent, portrays reality in human interest appeal.
4.2 per-cent, miscellaneous.

There were objections to the use of color, of course. Among them were: expense, non-cancellable requirements, sacrifice of coverage because of added expense, the product had no color, et cetera.

"There is really no one answer to the non-user of color. Each advertising program has to be considered in relation to the job to be done. It has been found quite difficult, for instance, to do a satisfying job in black and white for food advertising where color is available."

Then on pages 34 and 35 the committee closes the report with some very good suggestions to the newspaper publisher, but several are of use to the advertiser.

"In closing let us remind you of a few simple facts to keep in mind when you discuss color. First, color makes a better looking paper. Second, properly handled color is profitable. Third, team-work in production is an absolute must. Fourth, color can't do the impossible; it won't sell something that wouldn't sell in black and white. Fifth, only merchandise that lends itself to color promotion should be used in color advertising, and this means merchandise that has a chance to be sold. Don't use color to push out the 'dogs' in a department. Only merchandise that allows enough profit to stand the added expense of color rates and engravings should be promoted. And lastly, color demands more intelligent thinking and careful preparation than black and white. Don't run color for color's sake alone, but have something to say when you use it."

D. Direct Mail.

There is the saying that "clothes make the man". In other words, appearances count too. This is very true about any direct mail piece. An average person gets many pieces of direct mail in this day and age, so in order to have one stand out in this mob it must be different, an eye catcher. Its clothes must make it. Its color must make it. Good color and design not only have attention value, but retention value as well. Color in advertising is becoming more and more popular, especially in the direct mail line where an advertiser can get a two-color piece with the use of a colored ink and colored stock. Some very effective advertising can be created with a little care and thought, and still have the cost the same as the common black and white advertisement.

Harrie A. Bell, ~~and old hand~~ at direct advertising, lists the following three definite jobs that color has to do in direct advertising. [1]

[1] Getting the Right Start in Direct Advertising, pg. 116.

"1. It brightens up a piece of advertising, making it more attractive to the recipient and in consequence more likely to be looked at and read.

"2. It makes certain parts of a sales story (whether in type or illustration) easier to 'get', thus helping to impart the message more clearly and more rapidly.

"3. It helps to illustrate the exact, or approximate, appearance of a product, thereby arousing in the reader a more active desire for ownership."

Harrie Bell goes on to suggest that when studying the problem of whether to use color or not, that it be done by reference to the three foregoing points.

The use of color in direct mail advertising must use restraint. A few well chosen lines or spots in color will often impart more interest than a great splurge of color. Color for type matter should be used only for a few words or a few lines at the most, for whole paragraphs, especially in bright colors, are difficult to read.

In direct mail, your piece is against competition at all times, so therefore it must stand out from the mass of direct mail the average person receives daily. One sure way of doing this is by the careful choice of, and careful use of, color.

E. Outdoor.

Outdoor advertising signs or posters have several special problems because of the changing light conditions caused by the weather and the fact that day ends and night falls, making it necessary to use artificial light. The first problem is that of Irradiation. This is the illusion that makes dark things look small and light look large. Outdoor advertising makes two applications of this. One is that a

light colored poster panel or painted bulletin will appear larger than a dark one, and naturally, a dark one will appear smaller than a light one. The second application is that a dark letter on a light background will look thinner than a light letter on a dark background.

The second problem is illumination. The power of different colors to reflect and absorb light and the effect of various illuminants upon different colors all have to be considered in choosing colors for outdoor advertisements.

To help the outdoor advertising man to determine what colors to use, a table has been worked out to show the effect of various types of illuminants upon different colors. The quality of a light is measured by the physicist on the basis of the percentage of the red, blue, and green rays it contains. The proper proportion of each of these three, superimposed one over the other, will produce white. (White is the presence of all colors). Table II, page 58, lists the analysis of different types of illuminants. A glance over the table will show how each type of illuminant will effect any one color. Take the "blue sky". It will be noticed that it is deficient in reds and has an excess of blue. This means that reds, oranges, and yellows will appear duller under "blue sky" than under the noon-day sun. Blue and purple will appear stronger because of having more blue added to them. The ordinary Tungsten is considered a good light, but a glance at the table reveals that it is lacking in the blue content. It has approximately 11 percent blue. Yet it is still two-thirds short of the blue of noon sunlight. From this illuminant, some yellow will be added to greens, making them appear as green-yellows, and blues appear as blue-greens.

Table II.

Analysis of The Per-centage of Red, Green, and Blue in Illuminants.

Illuminant	% Red	% Green	% Blue
Noon sunlight	33.3	33.3	33.3
Blue sky	26.0	27.2	46.0
Over-cast sky	34.6	33.9	31.5
Afternoon sun	37.7	37.3	25.0
Daylight Mazda	39.0	37.0	24.0
Tungsten	48.3	40.8	10.9
Carbon Incandescent	51.1	40.5	5.4

(Outdoor Advertising - The Modern Marketing Force, pg. 75.)

Reds, oranges, and yellows will be stronger.

Legibility of letters on outdoor advertising is a very important thing, for if the message is not easily read then the value of the poster is lost. There have been several tests made to find out the legibility of combinations of colors. The follorwing is the result of one that the Outdoor Advertising Association of America , Inc. reported.

Rank	Letters		Ground
1.	Black	on	Yellow
2.	Black	on	White
3.	Yellow	on	Black
4.	White	on	Black
5.	Blue	on	White
6.	White	on	Blue
7.	White	on	Green
8.	Green	on	White
9.	Red	on	White
10.	White	on	Red
11.	Red	on	Green
12.	Green	on	Red

Yet the colors in this table may not be those that appeal to the users of your product, some legibility must be sacrificed for desired colors.

Outdoor posters are reproduced by the offset method. The limitations of this process must be kept in mind when making up copy for this medium. Beside all the regular problems of advertising layout and color, outdoor advertising has the two extra ones of irradiation and illumination which, as you have seen, affect and complicate the problem just that much more.

F. Car Cards.

Car cards, until recently, were concentrated in urban centers where population was sufficiently great to warrant local or interurban

transportation lines. Street cars, elevated lines, and subways were used. With the rapid growth of bus and commuters railroad traffic, however, the use of car cards has spread to such an extent that national advertisers can make profitable use of them. They are no longer restricted to particular or localized markets in cities or large towns.

Car cards reach all types of people and advertisers who sell a universally appealing product such as foodstuffs, cigaretts, drugs, or cosmetics, find they can make use of car cards very successfully. Because car cards reach such a universal group of people, care must be taken that only colors that appeal to the people as a whole as well as to the product are used. One of the methods used in printing car cards is the silk screen process, (See Part G, Chapter IV.), which, because of the nature of the process, requires simple layouts and basic colors. There can be no overlapping of colors to produce a third, because the printing inks are thick paint-like substances and one color is not applied until the other is dry.

G. Point-of-Purchase.

Advertisers have learned that the colors on the labels and cartons should be especially appropriate to the food contained in the package. Coffee in a purple container, chocolate in blue, or milk in brown would be unpleasing to most people. These preferences are not whim, but have sound phychological bases. Experiments in the laboratory have shown that a candy bar will melt faster in a black paper wrapper than in a white one. Potato chips are less likely to grow rancid in a green Cellophane bag than in a red or blue one. The best color for the

packaging of oilbearing foods is the green of luxuriant grass.

The most effective colors for the glass of milk bottles are sextant green, lantern-shade yellow, and signal red. Several dairy scientists have found that colored glass for milk bottles prevents the sctivated or "burned" taste that sometimes results when milk is left on a sunny porch for some time. [1]

Colors play a big part in the sales of products, not only in the large media, but also at the point of final sale where the purchaser has a chance to handle the goods. This final impression is the important one for it is the one that makes the sale.

The next chapter will take up the precautions in the use of color that must be watched by the advertiser when he uses color.

[1] Hepner, Harry W., Effective Advertising, pg. 462.

VI. Precautions in The Use of Color.

A. General

The more color advertising there is in a given medium, the less favorable the contrast enjoyed by an individual colored advertisement. Because of this any one advertiser must not use color just to dress up his advertisement. Before using color, the person contemplating using it must do some careful thinking. Can the use of color in your advertisement perform one of the following functions better than black and white? These functions include:

1. Attracting attention to the advertisement.
2. Representing objects, scenes, and people with complete fidelity.
3. Emphasizing some special part of the message or of the product.
4. Suggesting abstract qualities appropriate to the selling appeal.
5. Creating a pleasant first impression for the advertisement.
6. Creating prestige for the product, service, or advertiser.
7. Fastening visual impressions in memory.

The day has passed when color in advertisements on the inside pages of a magazine is a novelty. The first paragraph of Chapter I, if you will recall, stated that of the 70 full-page advertisements of a recent issue of the Saturday Evening Post, 72.9 per-cent were in color. This one issue can be taken as average for that magazine today, and upon examination it will be found that there will be little variation from this per-centage. Since so many advertisers use color today, they must find it profitable in the returns. Anyone that uses color, anyone that plans to use color in his advertising for the first time must use care and think well about what colors he is to use.

Below are some things that one must keep in mind when using color.

B. Psychological Effects

The psychological effects of color go back to the beginning of man. Because light was recognized as the principle of good and the sun as the most august of powers, men naturally were drawn to its phenomena, and particularly to color. Color, being the most wondrous manifestation of light, consequently led to many curious beliefs and associations, all to endow man with the power of ruling over destiny. The man of old related hues to the points of the compass, to the four elements, to the planets.

Medicine's early history is tied up with color. Belief in the healing power of color was universally admitted. Today science is largely skeptical, but psycholigists have found that color does affect the nervous system of people. The muscular tension of the body has been found to increase under the action of red light, and decrease under the action of green and blue light. Yellow makes people most cheerful, and violet has a subduing effect on people. Yellow-green is the most tranquil color, while purple is the most exotic color. Tests have indicated that these reactions to the above colors are fairly reliable guides.

C. Color Preference

From infancy, the favorite color is instinctively red or blue. Eugene Field has summed it all up in the following poem.

"Any color, so long as it's red,
Is the color that suits me best,
Though I will allow there is much to be said
For yellow and green and the rest;
But the feeble tints which some affect
In the things they make or buy
Have never - I say it with all respect -
Appealed to my critical eye.

There's that in red that warmeth the blood,
And quickeneth a man within,
And bringeth to speedy and perfect bud
The germs of original sin;
So, though I'm properly born and bred,
I'll own, with certain zest,
That any color, so long as it's red,
Is the color that suits me best."

Extensive tests have been made to determine both child and adult color preference for pure hues, shades, and tints. Tables IIIA, B, C, page 65, show the results of one of these many tests. Note the rapid collapse of red in the preferences of women the moment it is modified from a pure hue to a tint or shade. Generally among adults, pure hues are more liked than subdued colors, and tints are usually preferred to shades. Women are more tolerant of color modifications than men.

Indians like red, blue, and violet most and like green, orange, and yellow the least. The Negro's preferences correspond to those of other races - blue and red ranking highest. The love of red and blue even holds among primitive peoples as well as the insane and other mentally sick persons. Warm hues seem to appeal most to morbid persons, while cool hues to hysterical ones.

Faber Birren, one of our greatest color analysts, lists the following eight simple elements of appeal in his book The Story of Color (pg. 295):

Table IIIA

Preferences for Pure Hues.

Choice	Masculine	Feminine
First	Blue	Red
Second	Red	Blue
Third	Violet	Violet
Fourth	Green	Green
Fifth	Orange	Orange
Sixth	Yellow	Yellow

Table IIIB

Preferences for Tints.

Choice	Masculine	Feminine
First	Blue	Violet
Second	Red	Blue
Third	Violet	Yellow
Fourth	Green	Green
Fifth	Yellow	Orange
Sixth	Orange	Red

Table IIIC

Preferences for Shades.

Choice	Masculine	Feminine
First	Blue	Violet
Second	Violet	Blue
Third	Red	Green
Fourth	Green	Red
Fifth	Orange	Orange
Sixth	Yellow	Yellow

(All adapted from Luckiesh, Matthew, Light and Color.)

"1. Primitively, the eye is drawn to unique hues, red, yellow, green, blue, white, black. It prefers pure colors to modified colors.

"2. A very recent discovery is that the eye prefers lucid form in color to indefinite form.

"3. The emotional quality of any one color will differ as its forms differ. Ordinarily the primary hues are vigorous and impulsive. The secondary hues are more refined and perhaps more liveable.

"4. The red, orange, yellow region of the spectrum is warm. The green, blue, violet region is cool.

"5. In the harmony of pure hues, all look well with black and white.

"6. It is apparently true that colors accord best when they are either similar to each other or almost wholly unalike.

"7. In the harmony of color forms, the order of the triangle is exemplary.

"8. The most neutral of all forms is a tone, not gray."

People's preference in colors should be considered by the advertiser when he thinks about the use of color in his advertisements. If people do not like the colors you use, they will not think much of your products and your advertisements will not make a lasting impression in their minds.

D. Color Symbolism.

The symbolism of color dates back into the traditions of the people. The two tables, (Nos. IV, V, pages 67-69), following give the ancient and modern symbolism of color. Colors have been assigned to the four quarters of the earth, the elements, the planets, the signs of the zodiac, gems, and to notes of the music scale. Because colors do have the power of suggestion due to their symbolism, advertisers should be

Table IV

The Ancient Symbolism of Color

	Red	Yellow and Gold	Green	Blue	Purple	White	Black
Egypt	Man	Sun, universal power	Nature	Heaven, Sacred	Earth		
Greece	Love and sacrifice		Learning	Truth		Divinity	
Druids			Wisdom	Truth		Supreme Purity	
Brahmanism	Sacred	Universal understanding		True hue of sun			Evil
Confucianism	Confucius never wore red	Sacred		Sacred, the Ultimate			Sacred
Buddhism	Love and sin	Sun, universal power					
Shintoism	Blood and life		Wisdom			Eternity	
Persia		Glory	Immortality			Infinite Joy	Mystery
Mohammedanism	Sacred		World Mother			Salvation	Sin
Cabalism	Strength	Beauty	Victory	Mercy	"The Foundation"	"The Crawn"	Understanding

Continued on next page.

Table XV

The Ancient Chronology of Color

Table IV (continued)

	Red	Yellow and Gold	Green	Blue	Purple	White	Black
Hebraism	Sacrifice, Glory	Celest-ial	Terrest-ial	Glory of the Lord	Condescen-sion, Splen-dor	Purity Victory	
Christian-ity	Holy Ghost, Body of man Hell	Glory God the Sun, Mind of Man, Earth	Immor-tality	Hope, God the Father Spirit of man, Heaven	Penance	Purity	Death
Catholic-ism	Charity Sacrifice		Life Eternal		Affliction Melancholy	Purity Joy Glory	Death
Heraldry	Courage, Zeal	Loyalty	Youth, Hope	Piety, Sincerity	Sacrifice, Patriotism, Royalty	Faith, Purity	Grief, Penitence
The Arts and Scien-ces	Theology	Science	Medicine	Philosophy	Law	Arts and Letters	

(Adapted from Birren, Faber, The Story of Color, pg. 72.)

Table V

The Modern Symbolism of Color

Color	General Appearance	Mental Associations	Direct Associations	Objective Impressions	Subjective Impressions
Red	Brilliant, intense, opaque, dry	Hot, fire, heat, blood	Danger, Flag, Christmas, Fourth of July, St. Valentine's Day, Mother's Day	Passionate, exciting, fervid, active.	Intensity, rage, rapacity, fierceness
Orange	Bright, luminous, glowing	Warm, metallic, autumnal	Hallowe'en, Thanksgiving	Jovial, Lively, energetic, forceful	Hilarity, exuberance, satiety.
Yellow	Sunny, incandescent, radiant	Sunlight	Caution	Cheerful, inspiring, vital, celestial	High spirit, health
Green	Clear, moist	Cool, nature, water	Clear, St. Patrick's Day	Quieting, refreshing, peaceful, nascent	Ghastliness, disease, terror guilt
Blue	Transparent, wet	Cold, sky, water, ice.	Service, Flag	Subduing, melancholy, contemplative, sober	Gloom, fearfulness, furtiveness
Purple	Deep, soft, atmospheric	Cool, mist, darkness, shadow	Mourning, Easter.	Dignified, pompous, mournful, mystic	Loneliness, desparation.

Continued on next page.

Table V (continued)

Color	General Appearance	Mental Associations	Direct Associations	Objective Impressions	Subjective Impressions
White	Spatial Light	Cool, snow	Cleanliness, Mother's Day Flag	Pure, clean, frank, youthful	Brightness of spirit, normality
Black	Spatial darkness	Neutral, night, emptiness	Mourning	Funereal, ominous, deadly, depressing	Negation of spirit, death

(Adapted from Birren, Faber, The Story of Color, pg. 298.)

careful in their selection of colors to be used in advertising. One would not use red and green for Easter, when purple is the color that is used at Easter Time because of its symbolism of mourning and the direct associations with Easter.

E. Physical Effects.

All humans tend to see temperature and distance in color. The color of the advertisement must provide an atmosphere conducive to helping to sell his product.

Hot things are reddish, golden, or yellowish in quality, so products that are hot or give off heat should be advertised with the use of red, orange, or yellow. Cool things are greenish or bluish in quality, so products that are cool or give off coolness should be advertised with the use of green and blue.

Warm colors should be featured in advertisements as appearing nearest the eye, and cool hues are retiring and make appropriate backgrounds. The optical action of the eye gives red a larger apparent size and blue a smaller size. The colors of yellow, purple, and white are neutral in effect.

Colors also bring about the following physical effects or reactions: Red - attention getting, Yellow - cheerful, Yellow-green - tranquil, Green - refreshing, Blue - subduing, Purple - exotic.

The next chapter will take up the effects of color on results and pulling power of advertisements.

VII. Color and Its Effects on Results and Pulling Power.

The effects of colors can be checked in direct mail more easily than in some other forms of advertising. One of the most frequently quoted experiments in the use of color in direct mail was a sales letter sent out by James H. Rothschild, Barmon Brothers Company.

The company's mailing list consists of the names of some 30,000 prospective dealers and of this list 12,000 names were chosen. Twelve thousand letters were sent out, 1,000 being in color of stock and use of cuts. The letters were multigraphed and filled in with typewriter to match. The plain white letter brought in 9 per-cent returns; the letter on pink stock brought in 26 per-cent returns. It is interesting to note that using a blue instead of a white return envelope increased the returns considerably. In every case the use of cuts of the product brought a substantial increase in returns. Table VI, page 73, gives the complete returns of the experiments.

A word of caution. Some products do not go with the best pulling colors. Everyone who plans to use color should make tests of his own to determine which color best suits his product.

Records were also kept of the total number of replies and the duration of pull. The results, when tabulated, proved to be surprising. Note the difference in the duration of pull between letter Number 1, on white stock without illustrations, and letter Number 12, on pink stock with illustrations. Table VII, page 74, gives the complete tabulation.

Here is an experiment that The Union Trust Company of Detroit used to test the color preference for booklets that were given free for

Table VI

Effect of Color on Returns.

Letter No.	Color of Letter	Cuts	Color of Return Envelope	Percent of pull.
1	White	No	White	9
2	White	No	Blue	12
3	White	Yes	White	18
4	White	Yes	Blue	22
5	Corn	No	White	14
6	Corn	Yes	Blue	26
7	Green	No	White	16
8	Green	Yes	Blue	28
9	Gold	No	White	21
10	Gold	Yes	Blue	34
11	Pink	No	White	26
12	Pink	Yes	Blue	48

(Adapted from Starch, Daniel, Principles of Advertising, page 585.)

Table VII

Duration of Pull

No.	First Week	Second Week	Third Week	Fourth Week	Fifth Week	Total	Total Per-cent
1	18	32	21	11	8	90	9
2	20	37	36	15	15	120	12
3	60	61	34	9	8	178	18
4	54	78	58	21	6	217	22
5	34	53	39	11	2	139	14
6	61	141	43	12	3	260	26
7	86	67	..	6	..	159	16
8	90	164	22	5	2	283	28
9	72	131	5	3	..	211	21
10	65	258	13	2	1	339	34
11	58	193	7	..	2	260	26
12	63	407	8	1	1	480	48

(Starch, Daniel, Principles of Advertising, pg. 586.)

the taking. They had one booklet bound in stock of 10 different colors and placed copies of each color in five panels, strategically located in the lobby of the bank. Each color was displayed for 14 days. The number of booklets of each color taken from the racks were: [1]

Color	Number Taken
Dark Blue	162
Brown	142
Pale Blue	94
Green	93
Light Green	88
Yellow Orange	87
Cream	87
Lavender	85
Orange	78
Light Orange	77

This test proved to the Bank People that colorful covers for the booklets alone did not do the trick, but that simple colors, such as dark blue and brown, have the strongest appeal and pulling power.

The following is from the Direct Mail Advertising Association Member's Bulletin, Vol. 26, No. 3, (March 1946), page 11, "In a number of tests to determine the effect of color on direct mail returns, some rather startling figures developed.

Test No. 1 Green envelopes outpulled orange by 3.2%.
Test No. 2 Blue reply cards outpulled rose by 9.3%.
Test No. 3 Four-colored stuffers outpulled black and white by 20%.
Test No. 4 Two shades of blue ink on blue letterheads outpulled black and red on white by 27%.
Test No. 5 Pink return envelopes outpulled blue by 30%.
Test No. 6 Goldenrod return envelopes outpulled pink by 40.2%.
Test No. 7 Blue return cards outpulled pink by 24.7%.

[1] Hepner, Harry W., Effective Advertising, pg. 464.

Test No. 8. Pink reply cards outpulled white by 50%.
Test No. 9. Pink letterheads outpulled green by 80%.
Test No. 10. Blue envelopes outpulled yellow by 151%.

There are the facts -- the results of tests made by different companies in different parts of the country at different times".

Many advertisers feel that the added cost of color advertising is worth the expense because of the increased returns that the added color brings in. The expense is of course set off by the greatly increased profits that are realized because color was used, but again color should not be used just because one wants to use color. The use of color takes well thought out planning for its use.

Conclusions.

"This is the age of color". Advertising has taken color as one of its chief tools. Examination of any national magazine today will prove this statement. It is also a fact that the more that use color in any one issue, the less is the ability of any one advertiser to gain attention over his competitors. Yet in spite of this fact the use of color continues on an increasing scale.

The use of color today takes a lot of careful study on the part of the advertiser before he dare venture out into the battle of the rainbow. The advertiser must know the physical nature of color; what color is; how it is seen; what color blindness is and how it affects people's color perception. The advertiser must know a common color system so that he may tell the printer what color he wishes and be sure that the printer knows just what color he is asking for. No doubt the advertiser knows the methods of printing, but does he know their limitations in regard to the printing of color? Each advertising medium has its own limitations when it comes to color advertising. Then there is the question of the precautions to be taken in the use of color advertising. Never use color just for the sake of using color. Color has its psychological and physical effects on the human body. People have their inborn, natural likes and dislikes when it comes to colors. All these things must be known by the advertiser who wishes to go into the field of colored advertising.

This thesis has gone into many of the beforementioned problems, perhaps not in an exhaustive way, but deep enough to acquaint one with some of the answers to them. The problem is to some extent new and like

all new subjects there is new material coming out all the time. The wise advertiser is one that is always studying and reading; he will be the one that keeps up to date.

Appendix.

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Appendix A.

Example of three color letterpress.

Plates made by:
The James McKinnon Company
Springfield, Massachusetts

Progressive proof by:
The James McKinnon Company
Springfield, Massachusetts

Order of printing:
1. Yellow
2. Red
3. Blue

Screen Angles:
Yellow - 90 degrees
Red - 75 degrees
Blue - 105 degrees











Appendix B.

Example of four color letterpress.

Plates made by:
The James McKinnon Company
Springfield, Massachusetts

Progressive proof by:
The James McKinnon Company
Springfield, Massachusetts

Order of printing:
1. Blue
2. Black
3. Red
4. Green

Screen angles:
Blue - 75 degrees
Black - 45 degrees
Red - 105 degrees
Green - 105 degrees
(note; Same screen angle for the red and green plates, but there is no over-printing.)


The Accelerator
DECEMBER 1946
A
MERRY
CHRISTMAS



A

R


The Accelerator
DECEMBER 1946
MERRY
CHRISTMAS




M Y
C R T S


The Accelerator
DECEMBER 1946
E R
H I S M A


The Accelerator
DECEMBER 1946
E
S
A


R
H I M

Appendix C.

Example of four color process.

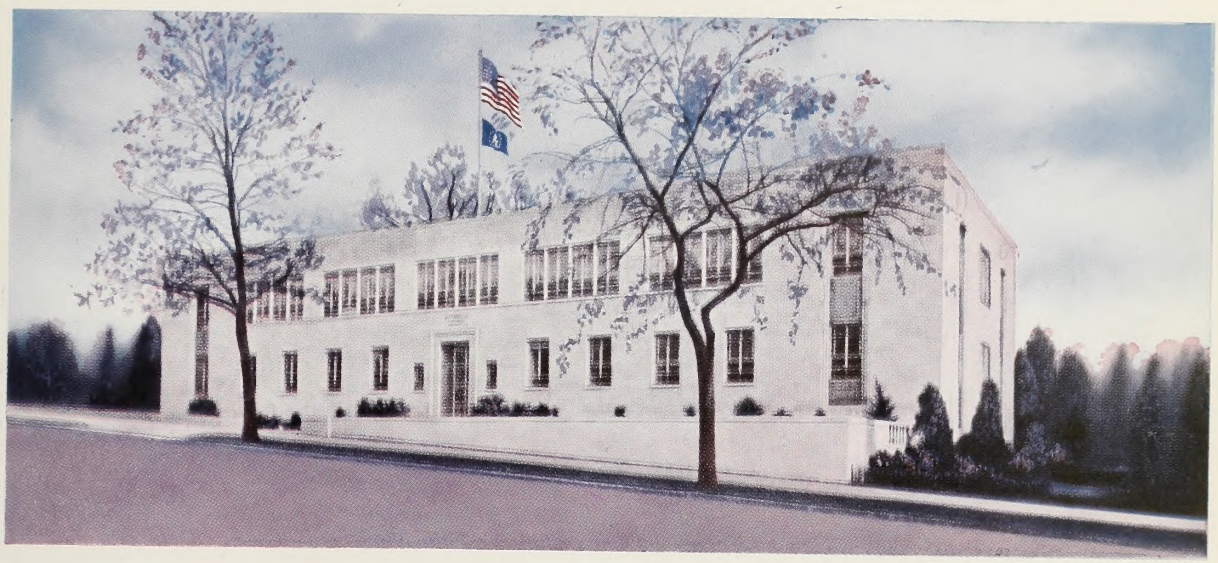
Plates made by:
The James McKinnon Company
Springfield, Massachusetts

Progressive proof by:
The James McKinnon Company
Springfield, Massachusetts

Order of printing:
1. Black
2. Blue
3. Red
4. Yellow

Plate angles:
Black - 45 degrees
Blue - 105 degrees
Red - 75 degrees
Yellow - 90 degrees



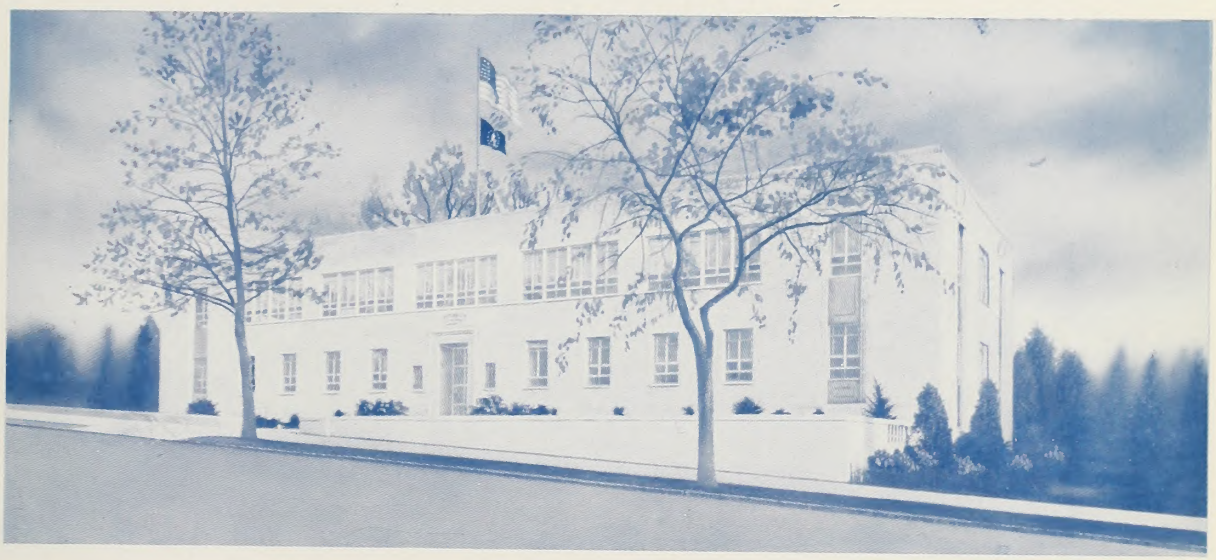


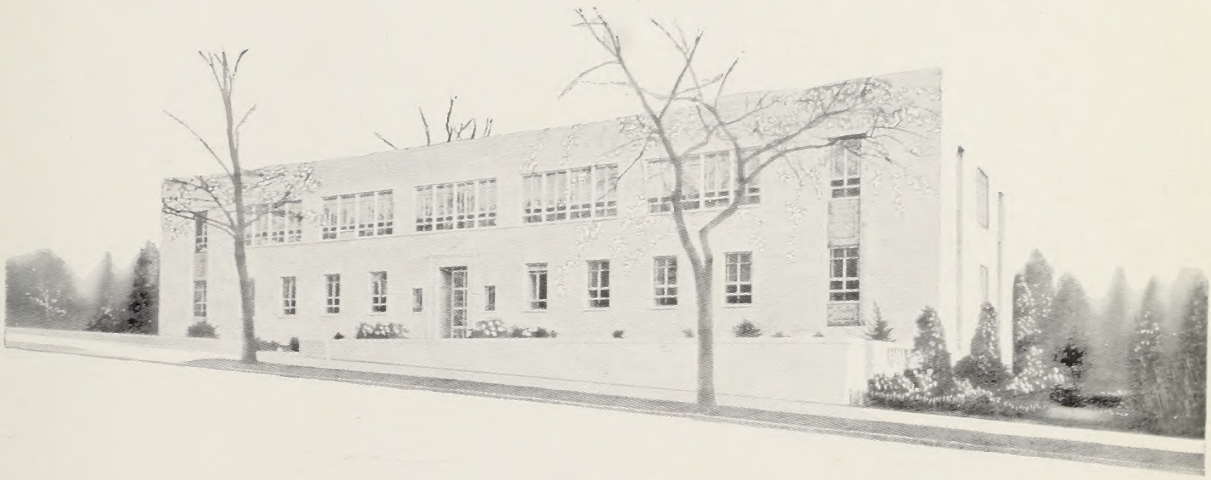




HARVARD BUSINESS SCHOOL BAKER LIBRARY ADMINISTRATION


SMITHSONIAN INSTITUTION LIBRARIES
BOSTON PUBLIC LIBRARY



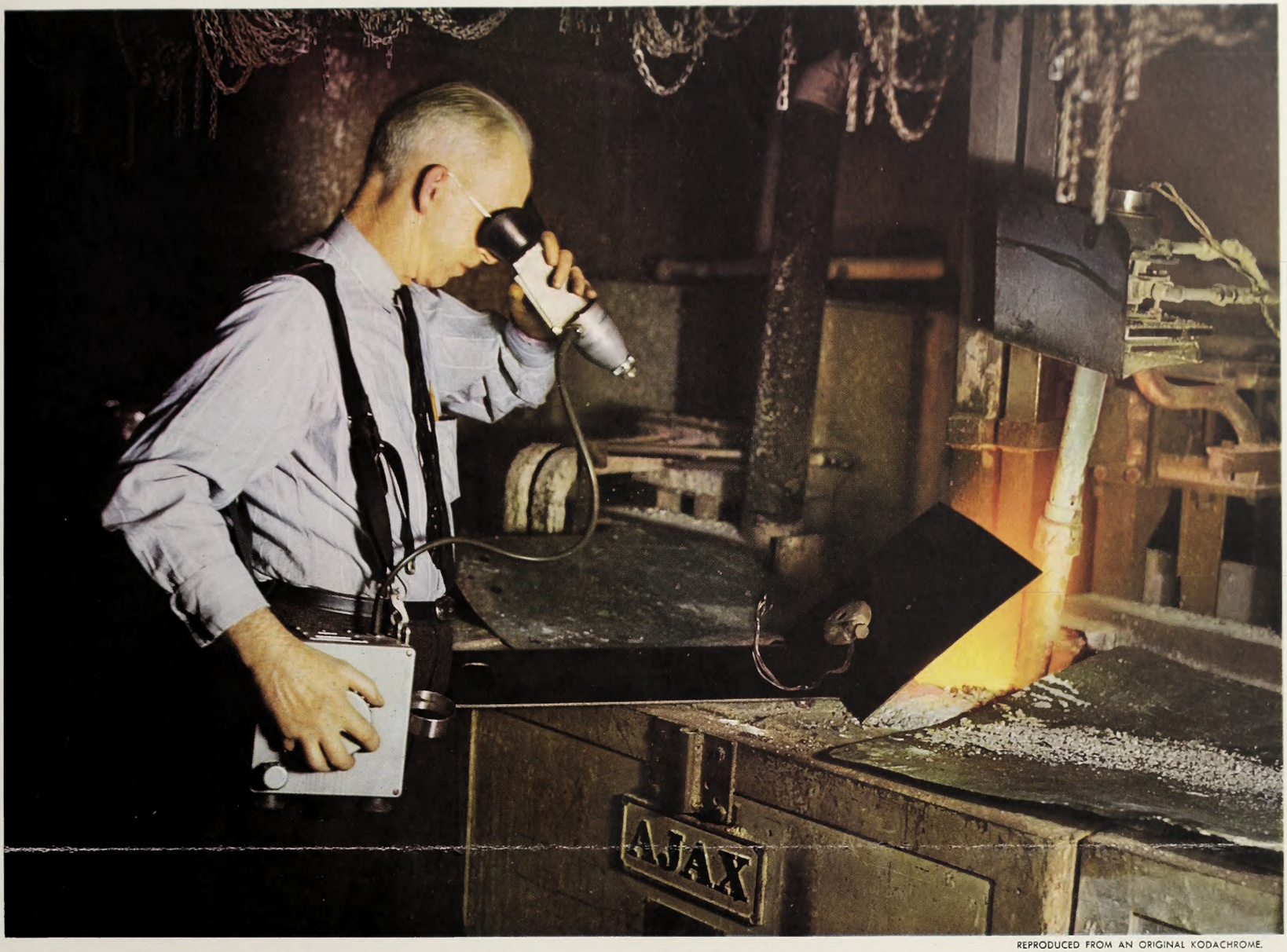


Appendix D.

Examples of Four Color Letterpress

Press work by:

Cote Press
Springfield, Massachusetts

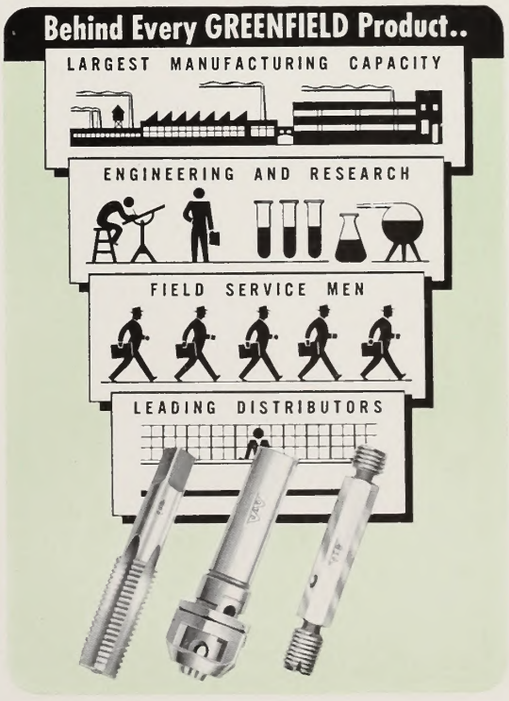


REPRODUCED FROM AN ORIGINAL KODACHROME.

When the tap's in the fire . . .

This "Greenfield" man is measuring heat with as much precision as though he was using a micrometer to measure size. He is using an optical pyrometer. On his technical skill depends to a large degree the performance of the finished product in your plant. Improved furnaces, precise heat measuring devices, and the continuing accumulation of "know-how" have made the heat treating of tool steels an exact science in "Greenfield" plants.

It is a science that contributes much toward your getting ***more for your money*** when you use "Greenfield" tools and "Greenfield's" "Show-How" field service.



GTD GEOMETRIC

GREENFIELD

GREENFIELD TAP and DIE CORPORATION

GREENFIELD, MASSACHUSETTS

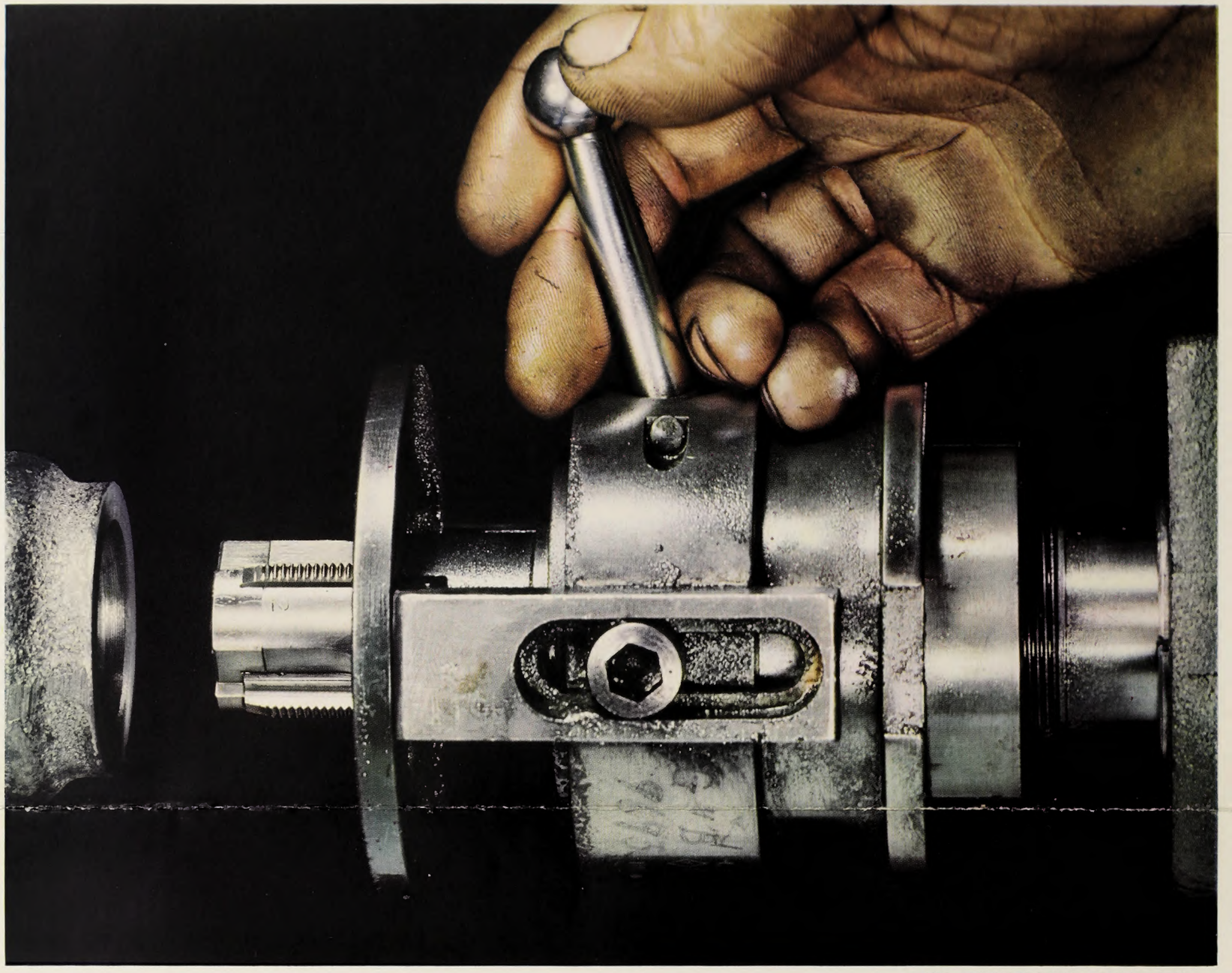
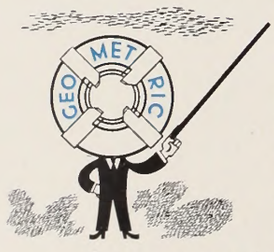


PHOTO. COURTESY OF GILBERT and BARKER MFG. CO.

At his finger-tips . . THREADING PERFORMANCE

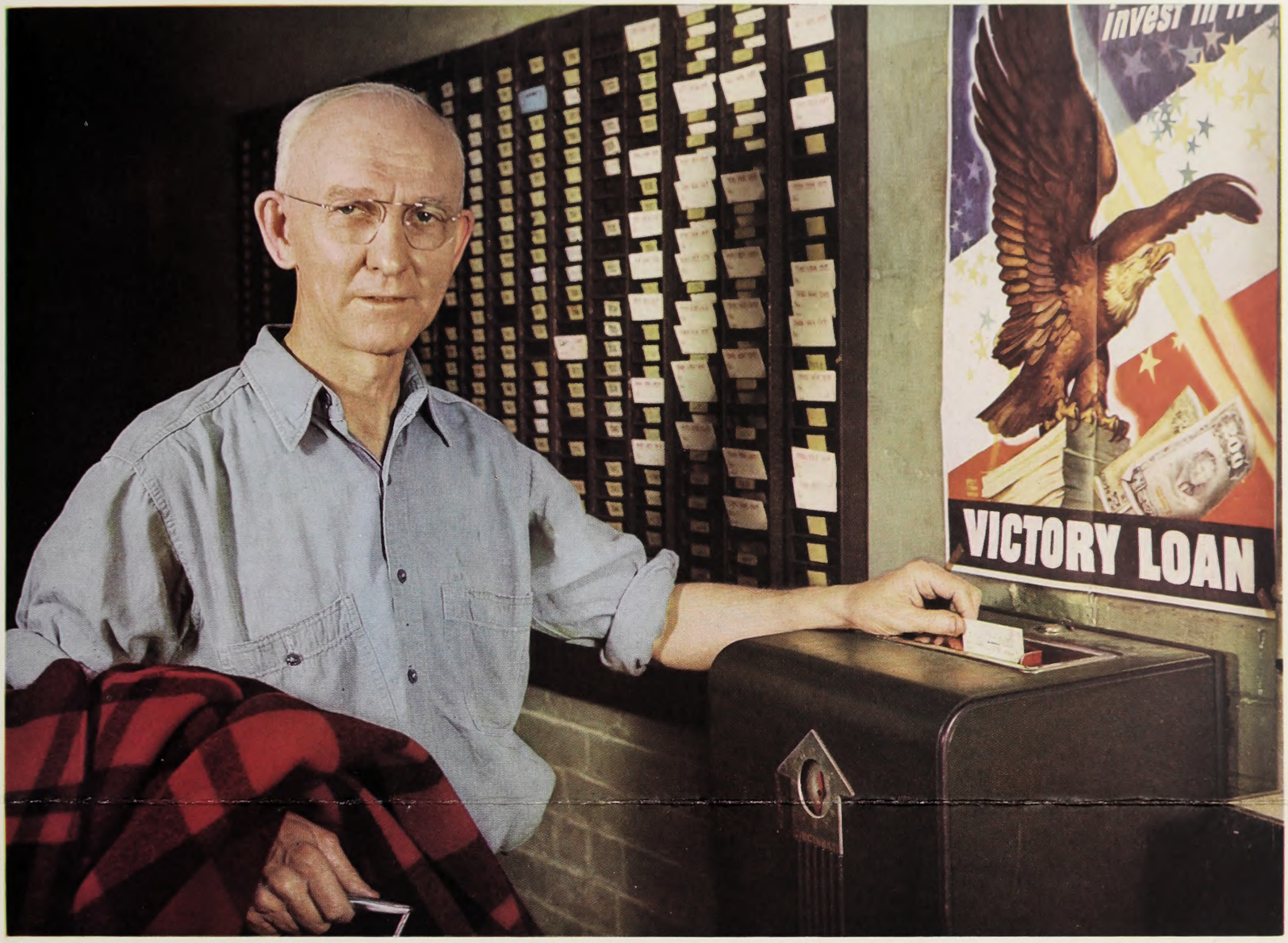


This is a simple, rugged tool. It has taken the headaches out of internal threading in hundreds of plants. It is a Geometric "Class S" Collapsing Tap (the type shown above is for stationary use, has a plate trip and is reset by the conveniently placed handle). The "Class S" Tap is suitable for stationary and rotary use and is convertible into different types of trip. In addition Geometric "Class S" Taps can be used on almost any machine and for nearly every threading job over $1\frac{1}{4}''$ in diameter. Their reputation is built on their unequalled record of threading performance in leading plants throughout the world.

FOR NEARLY EVERY THREADING JOB — A GEOMETRIC!

If you have in mind a particular threading problem, we will be glad to have our engineers give you their recommendations, based on over a half century of specialization in this field. Why not let us send you the latest Geometric catalog?

THE
GEOMETRIC
TOOL COMPANY . . NEW HAVEN 15, CONN.
A Division of Greenfield Tap and Die Corporation



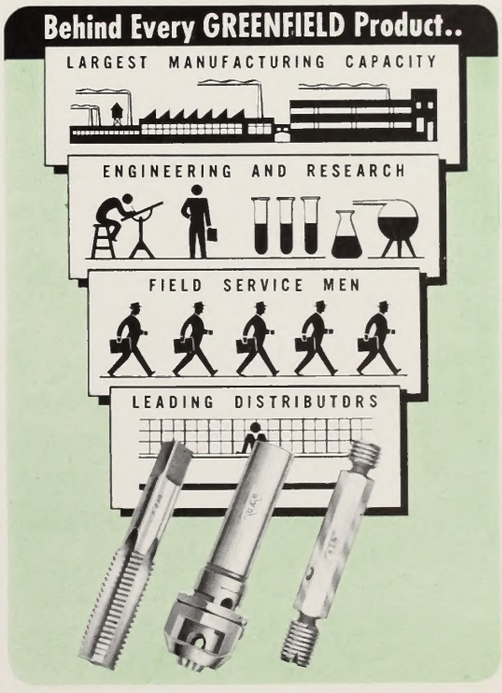
Not 62,940 hours for nothin'!

I figure I've punched in over 62,940 hours for GTD.

Maybe you fellows who buy threading tools don't realize it, but those hours mean something when you buy a tap, die or gage with the GTD mark on it. Those hours mean better workmanship—the result of years of learning by doing.

You might be interested to know that in the "Greenfield" organization there are 296 of us who have spent 20 years or more at our jobs—making high quality threading tools.

When you buy "Greenfield"—you buy precision. And precision takes practice.



GREENFIELD

GREENFIELD TAP and DIE CORPORATION

GREENFIELD, MASSACHUSETTS

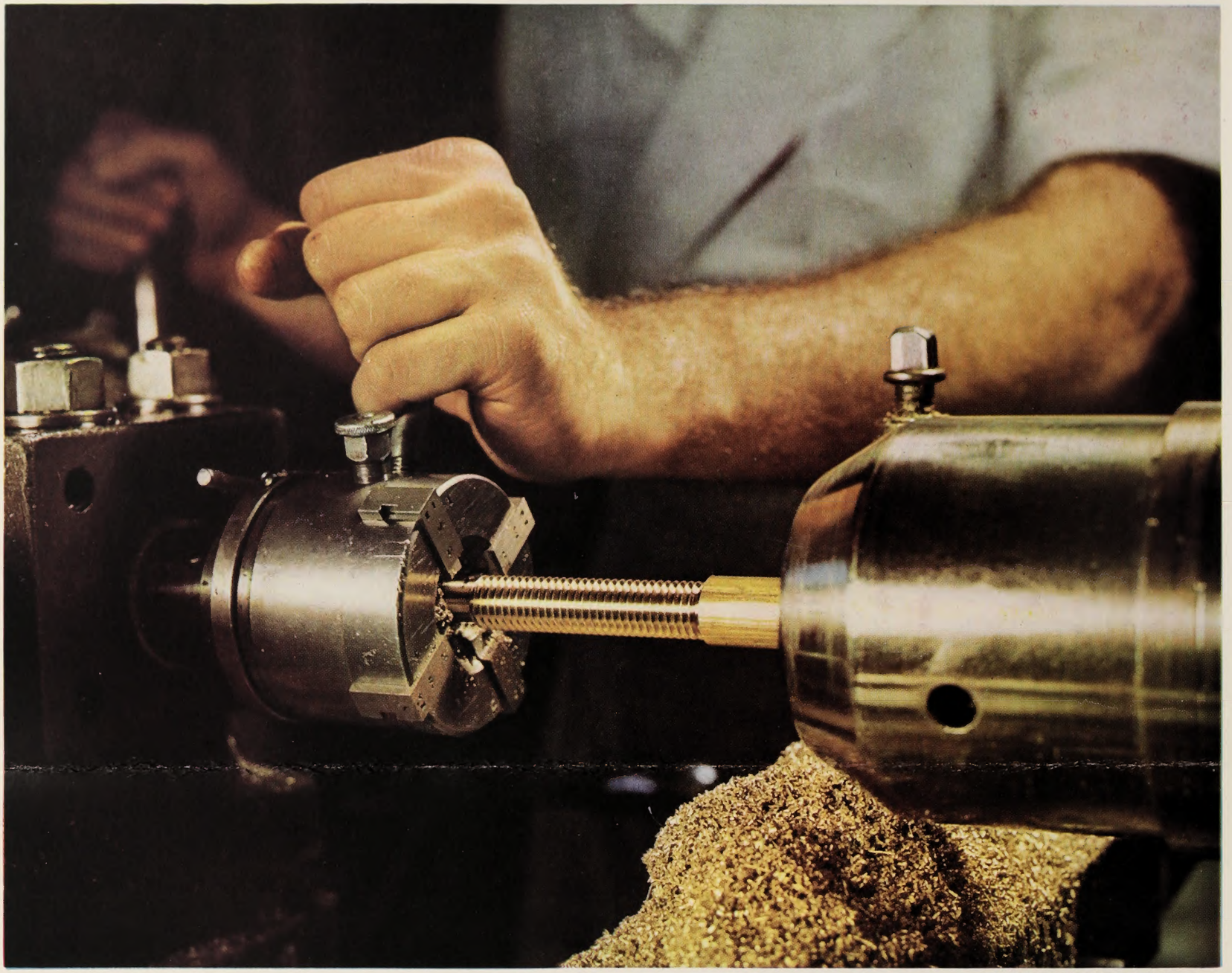


PHOTO COURTESY MANNING, MAXWELL AND MOORE, INC., BRIDGEPORT WORKS

YOU BET — IT'S A GEOMETRIC!



This photograph might have been taken in any one of thousands of metal-working plants all over the world. It shows the dean of all Die Heads—the Geometric Style "D"—cutting $\frac{5}{8}$"-11 NC threads on an adjusting spindle for a precision steam control device. This simple, sturdy threading tool has been a favorite for over 50 years wherever metal is worked on a production basis. The particular Die Head illustrated is the $\frac{3}{4}$" Style "D" Geometric Die Head and easily cuts threads from $\frac{1}{4}$" to $\frac{3}{4}$" while the whole Style "D" line cuts threads from $\frac{1}{8}$" to $3\frac{1}{2}$".

FOR NEARLY EVERY THREADING JOB — A GEOMETRIC!

If you have in mind a particular threading problem, we will be glad to have our engineers give you their recommendations, based on over a half century of specialization in this field. Why not let us send you the latest Geometric catalog?

THE
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TOOL COMPANY . . NEW HAVEN 15, CONN.

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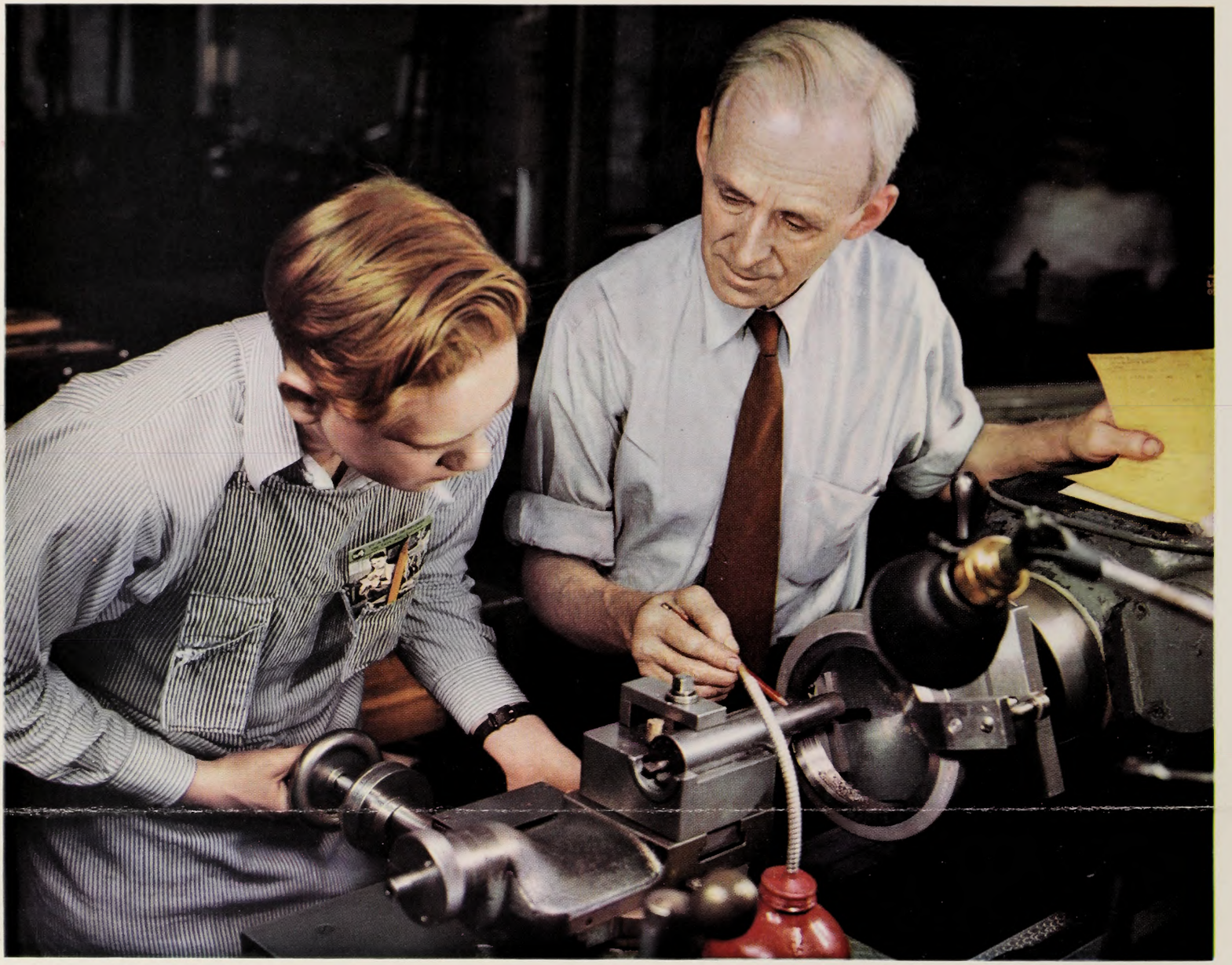


Precision

THREADING TOOLS

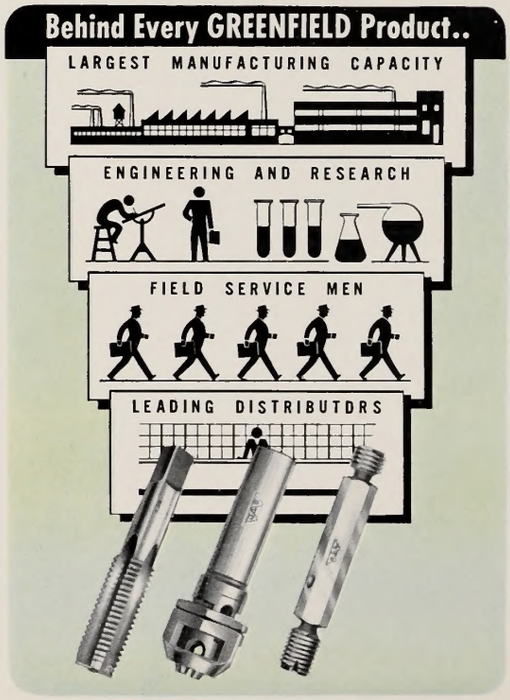
THE
GEOMETRIC
TOOL COMPANY . . NEW HAVEN 15, CONN.

A Division of Greenfield Tap and Die Corporation



"Son, we've got a world reputation to keep"

"When this tool is finished, it will carry the GTD mark. And that mark stands for quality in every machine shop in the world—from Detroit to Delhi, from Quebec to Capetown. When I came to work here 27 years ago, "Greenfield" was world famous for its threading tools. Yet those tools we made then were crude beside the ones you're working on right now. It's up to you, son, to keep making better and better tools so that when you're my age people will still be saying, *'You get more for your money when you buy from "Greenfield".'* Good luck, son."

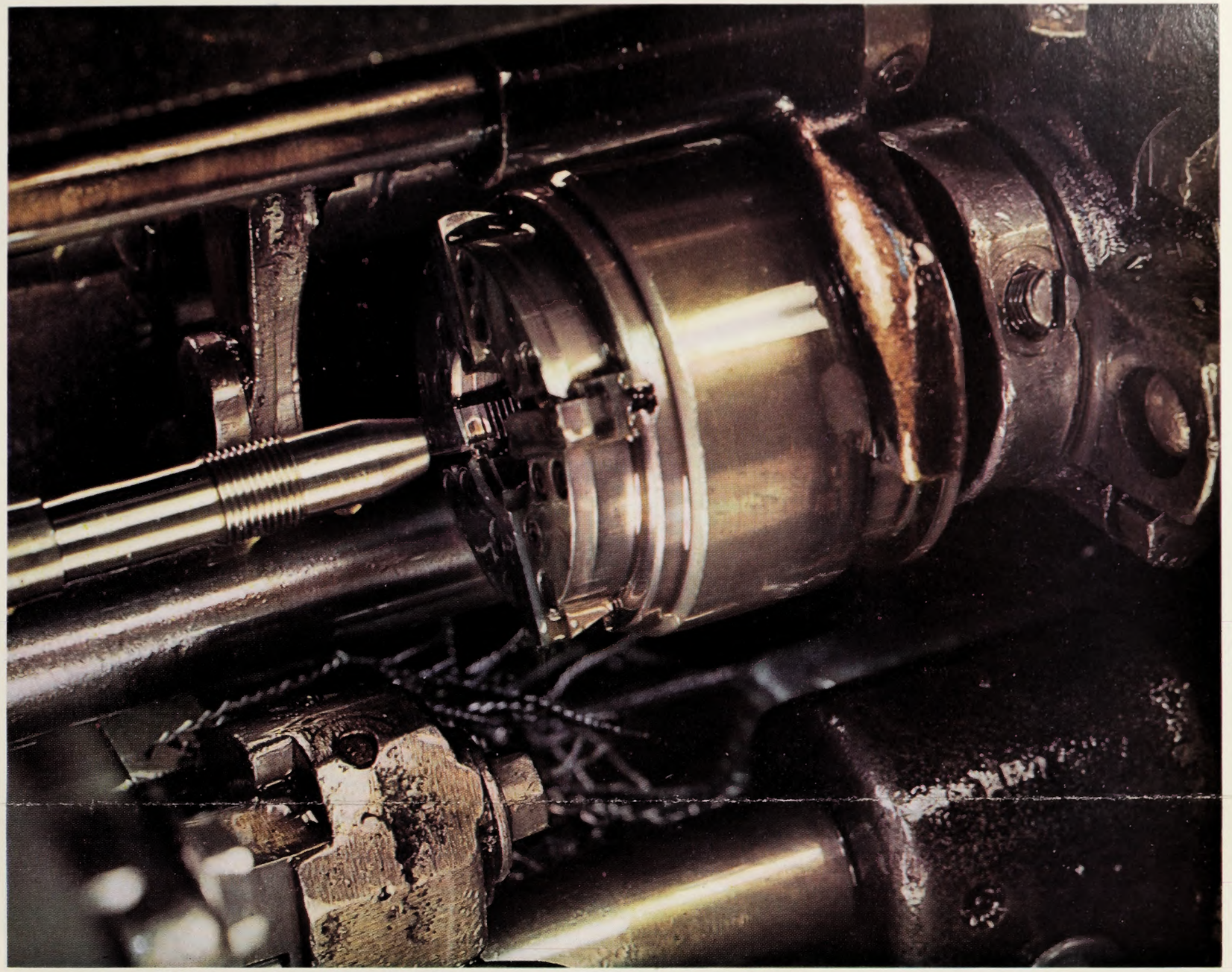


GTD GEOMETRIC

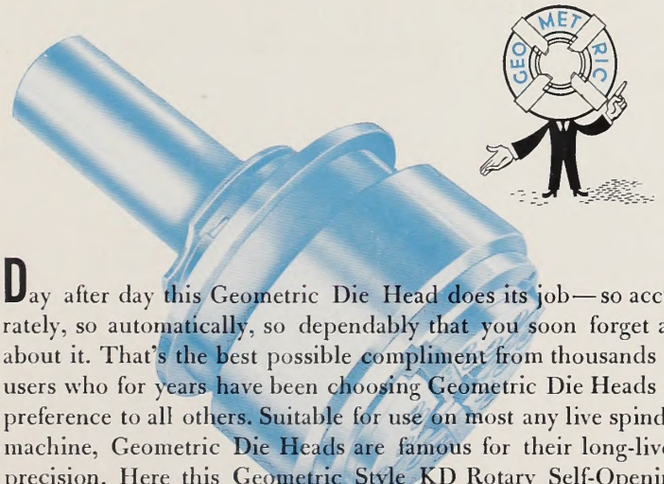
GREENFIELD

GREENFIELD TAP and DIE CORPORATION

GREENFIELD, MASSACHUSETTS



A Die Head You Can Forget!



FOR NEARLY EVERY THREADING JOB — A GEOMETRIC!

If you have in mind a particular threading problem, we will be glad to have our engineers give you their recommendations, based on over a half century of specialization in this field. Why not let us send you the latest Geometric catalog?

Day after day this Geometric Die Head does its job—so accurately, so automatically, so dependably that you soon forget all about it. That's the best possible compliment from thousands of users who for years have been choosing Geometric Die Heads in preference to all others. Suitable for use on most any live spindle machine, Geometric Die Heads are famous for their long-lived precision. Here this Geometric Style KD Rotary Self-Opening Die Head is cutting a $\frac{3}{4}$"-16 N. F. thread on a hollow chuck component. Note its compact and rugged design, particularly adapted to multi-spindle automatic screw machines. *Write for complete details about the "Style KD" and other Geometric Die Heads.*

THE
GEOMETRIC
TOOL COMPANY . . NEW HAVEN 15, CONN.

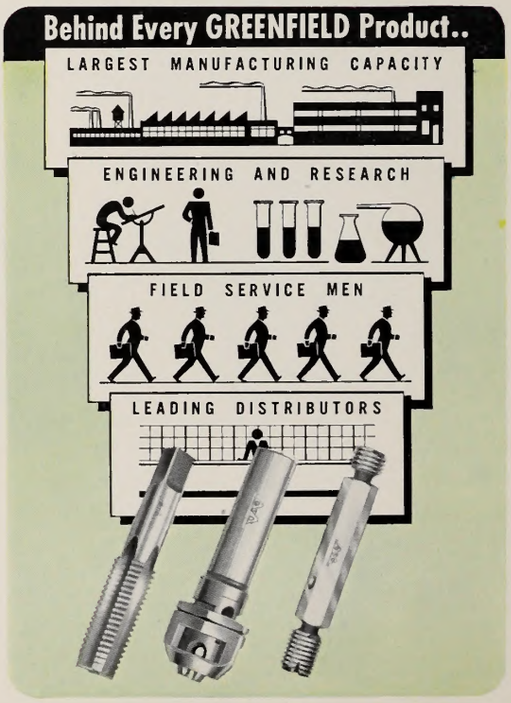
A Division of Greenfield Tap and Die Corporation



Feeling a tap's pulse

Visitors to the "Greenfield" plants are amazed at the laboratory techniques that are now a part of modern threading tool and gage manufacture. Surrounded by every device for the measuring and testing of precision tools, "Greenfield" metallurgical scientists and technicians keep tabs on "Greenfield" products every step of the way from the raw stock to the finished product.

In these metallurgical "clinics," they check the chemical composition, the microstructure, the hardness, the toughness, and the wear resistance. Because of such vigilance, users of "Greenfield" tools get ***more for their money*** in threading tool performance.



GTD GEOMETRIC

GREENFIELD

GREENFIELD TAP and DIE CORPORATION

GREENFIELD, MASSACHUSETTS



Appendix E.

Example of Color in Newspaper

The Boston Herald
Boston, Massachusetts



First in fashions...
First in color

Have you ever wondered just how a certain dress would appear when you wore it? Now you may see exactly how that hoped-for creation will look. The Boston Herald-Traveler will print from time to time full color reproductions of the latest in fashion.

As our full-color printing facilities increase, this innovation in newspaper printing will be included in all editions of the Herald and Traveler.

New England's Leading Newspaper

The Boston Herald-Traveler



Onondaga "American Artist" print.

First in fashions...
First in color

The Boston Herald-Traveler, always the leader in fashion news for its readers, leads once again in presenting to its readers fashions in full color. From time to time we will feature illustrations of the latest Spring creations in all their natural color and beauty.

As our full-color printing facilities increase, this innovation in newspaper printing will be included in all editions of the Herald and Traveler.

New England's Leading Newspaper

The Boston Herald-Traveler

Appendix F.

Example of Color Tip On

The Boston Herald
Boston, Massachusetts

Jordan Marsh

NEW ENGLAND'S LARGEST STORE

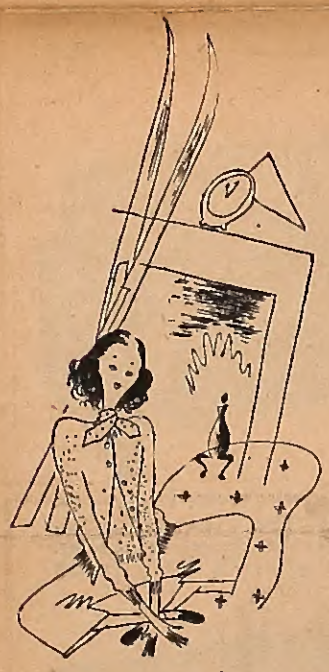


CLASSIC CAMPUS UNIFORM



CASUAL CAREER COSTUME

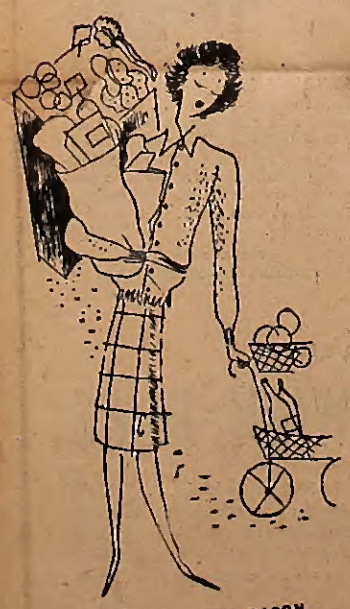




AFTER THE SKI PARTY



CHRISTMAS IS COMING!



BRINGING HOME THE BACON



AT THE SKATING CLUB

Good Companions . . . . . .

OUR HANDSOME, HEAVIER-WEIGHT ALL-WOOL CAROIGAN

AND MATCHING SLIPON FOR YOUR CASUAL WARDROBE

ON CAMPUS, AT THE OFFICE, AT LEISURE AT HOME

5.00 each

Wonderful new edition of your favorite classics . . . these beautifully made sweaters in the heavier weight you prefer for frosty winter mornings. They're of soft 100% virgin wool, of course, in a marvelous selection of eleven fashion-wise colors to brighten up your dark and neutral skirts, combine lusciously with plaids. Indispensable for the well-dressed college girl on campus . . . so comfy to slip into after skiing, protect you from draughts at home or at the office. Take your pick today, while the wide choice of colors lasts. Sizes 34 to 40.

A LAVISH ASSORTMENT OF ELEVEN COLORS

PINE GREEN	CHOCOLATE
CRIMSON	SKY BLUE
CADET GREY	NAVY
MAIZE	BEIGE
BLACK	AQUA
	SHELL PINK

READY FOR YOU TODAY—IN NEW ENGLAND'S LARGEST STORE—SWEATER SECTION—STREET FLOOR—MAIN STORE

Appendix G.

Example of Color on Front Page

The Boston Herald
Boston, Massachusetts

Rain
BOSTON AND VICINITY — Cloudy, with rain beginning today and continuing tonight. Tides—High: 10:58 A.M., 11:18 P.M. Low: 4:44 A.M., 5:07 P.M. Sunrise—5:19, Sunset—6:15. Full report on Page 2.

THE BOSTON HERALD

LATE CITY EDITION

VOL. CCII NO. 95 (Copyright, 1947) Boston Herald-Traveler Corporation BOSTON, SATURDAY, APRIL 5, 1947—SIXTEEN PAGES ★★★★ THREE CENTS

TEACHERS CRY 'SHORT-CHANGE'

Union to Fight Phone Seizure Ruling

STRIKE STILL POSSIBILITY MONDAY A. M.

Surprise Opinion By Clark Based On War Powers

By LOUIS STARK
[Boston Herald-N. Y. Times Dispatch]

WASHINGTON, April 4—Atty.-Gen. Tom C. Clark, in a surprise announcement today, declared that President Truman had the authority to seize the nation-wide network of telephone lines if the employes go on strike as scheduled Monday at 6 A. M.

Counsel for the National Federation of Telephone Workers at once disagreed with Clark's opinion, according to Joseph A. Beirne, federation president, leaving open the possibility that the strike still may occur.

Designates Act

As he was leaving the White House after a cabinet meeting the Attorney-General told reporters that the President's seizure powers were set forth under the Federal Communications Act.

Clark admitted that he had given his opinion to Secretary of Labor Schwellenbach, who had asked for it, but that he had not advised the President. The secretary had asked the Attorney General for the opinion yesterday.

Clark's opinion was one of the outstanding developments of a day filled with conferences on the issue presented by the demands made by the NFTW, chief of which is one for a wage increase of $12 a week. These conferences continued until a late hour tonight after a dinner recess.

No Wage Offer

With the strike deadline for 287,000 employes in 39 NFTW affiliates only 54 hours off, neither spokesmen for the American Telephone & Telegraph Company and the Bell System nor their affiliates had indicated any intention of offering a wage increase to the employes.

Two or three affiliates, it was said, have offered to submit to arbitra-

(Continued on Page Five)

News Bureau Here Ends Publication After 60 Years

The Boston News Bureau, one of the leading financial daily newspapers of the country, will suspend publication permanently today after 60 years of uninterrupted service, the management announced last night.

Keen competition in this territory has made further publication of the News Bureau uneconomic, the statement adds, and has even brought the Boston publication into rivalry with its own affiliate, the Wall Street Journal, published daily in New York.

Although the News Bureau will no longer be issued, the editorial and reporting staffs will be maintained and will continue to gather

(Continued on Page Two)



(Color Photo by A. B. Reed)

MEMBERS OF THE SERVERS' GUILD at the Cathedral Church of St. Paul stand before the beautiful altar in the church's intimate Boston Prayer Shrine, which is guarded by perpetual candlelight and surrounded by the flags of all the United Nations. Left to right are, Donald West of West Roxbury, an acolyte; James Blaine of Boston, the crucifer, carrying a replica of the famous cross of Cong, one of Ireland's treasures and Roland Price of West Roxbury, another acolyte.

Devout Fill Boston Churches

Three Haur Devations Feature Special Good Friday Services

By ELIZABETH SCHOPPE

Capacity congregations of devout thronged Greater Boston churches yesterday for Good Friday services commemorating the crucifixion and death of Christ on Calvary.

Practically all Catholic and Protestant churches observed in some way these most solemn rites of the Christian year. Symbolic of the three anguished hours that Jesus endured on the cross was the Three Hours' Devotion held in many churches, when from noon to 3 P. M. clergymen recalled the seven last words of Christ interpreted in the light of modern events and problems.

Workers Dismissed

In Catholic churches, where altars were stripped of linen and sacred ornaments, and bells and instrumental music silenced, only one mass was celebrated—the mass of the presanctified with the sacred host consecrated on Holy Thursday and preserved in a repository.

State department heads dismissed from duty, by direction of Gov.

(Continued on Page Five)

URGE AIRPORT COMPLETION

Airlines Ask State Spend $19,000,000

The state-owned Boston Airport can be operated on a self-supporting basis by 1951, but only on condition that the Legislature appropriates an additional $19,000,000 this year to complete development of the property, spokesmen for the nation's leading airlines told Gov. Bradford and legislative leaders at the State House yesterday.

Nearly 50 persons immediately concerned in the airport project attended the meeting, which was called by the Governor at the request of airlines now using the field.

Progress Proised

"The Boston Airport is a marvelous site and the state has made marvelous progress in promoting air commerce for the Commonwealth," said Ralph S. Damon of New York, president of American Airlines and spokesman for the airline interests represented at the conference.

"However, we feel that the air-

(Continued on Page Two)

3 Greot Creeds Share Holy Land In Sacred Rites

JERUSALEM, April 4 (AP)—Christians knelt in prayer, Jews bowed their heads in solemn Passover rites, and Moslems worshipped at the shrine of the prophet, Moses, today in this ancient Holy Land, sacred to all three religions.

Some 15,000 worshippers of Jesus Christ prayed before 14 altars representing incidents in Jesus' path of agony to Calvary hill.

Hard by, nearly 15,000 Moslems prayed in their mosque in Haram Esh Sharif, and then set out on their annual pilgrimage to Nebi Musa, in commemoration of the death of the Jewish prophet, Moses, believed to be buried near Jericho. The Moslems believe God handed the law to Moses and the gospel to Jesus.

At sunset, Jerusalem's Jews by the thousands visited the Wailing Wall to pray. The wall, a towering barrier between the Moslem mosque area and the Jewish quarters of the old city, will be the scene of daily prayers during the eight-day Passover observance, which began tonight.

Easter Buying Spree Nears New Records

By FRED RAE

One of the greatest Easter shopping sprees on record continued in downtown Boston yesterday, with clothes-conscious crowds thronging the district for late-hour purchases of finery. Crowds of equal or greater size are expected today.

A detail of 50 extra policemen augmented the normal force in the area to direct traffic, as the throngs overflowed the sidewalks and exercised the traditional Boston prerogative of walking in the street.

Increased Sales

Police Supt. Edward W. Fallon described the crowd as "one of the largest ever seen in the city." After a tour of the district, he observed that the area was "crowded with women loaded with bundles, good humor and enthusiasm."

As the Easter shopping boom reached its climax, the Federal Reserve Bank of Boston reported that

(Continued on Page Sixteen)

SENATOR ASKS SOVIET CHECK

George Airs Politics Of Greek-Turk Loon

By C. P. TRUSSELL
[Boston Herald-N. Y. Times Dispatch]

WASHINGTON, April 4—Focus on the Greek-Turkish aid program was shifted bluntly today from its relief and reconstruction aspects to its political implications by Senator George (D.-Ga.). George, as second ranking Democrat on the Foreign Relations Committee, voted yesterday to report the $400,000,000 assistance bill to the Senate. Debate is scheduled to start not later than Wednesday.

"I deliberately place my support of this bill on the belief that it is vital to us to check Russian expansion now," Senator George said. "If unchecked, Russia will inevitably overrun Europe, extend herself into Asia and perhaps South America. . . . Non-action will not check Russian expansion."

Support Plan

Senators Tydings, (D.-Md.), Murray (D.-Mont.), and McMahon (D.-Ct.), also announced their support of the President's program.

Sen. Vandenberg (R.-Mich.), chairman of the Foreign Relations Committee, said it may report formally on the measure tomorrow.

Sen. Wherry of Nebraska, the Republican whip, said informal discussion by the policy committee showed a wide variance of opinion. He said he personally has not made up his mind whether to vote for the bill.

(Continued on Page Three)

Senate Maps Own Tax Bill

Set to Nip Long Delay

By SAMUEL A. TOWER
[Boston Herald-N. Y. Times Dispatch]

WASHINGTON, April 4—A decision to proceed with legislation on tax reduction, if Senate-House conferees fail to agree soon on how much President Truman's 1948 budget should be cut, was reached today by the Senate Republican policy committee.

The group was said to have set a two-week period for resolution of differences in the conference committee. Then, if the deadlock between the House conferees supporting a $6,000,000,000 cut and the Senate members proposing a $4,500,000,000 cut were not ended, the policy group favored action to draft a tax bill.

Tax After Labor

In anticipation of early consideration of such a measure, tax reduction appeared for the first time in the forthcoming legislative program for the upper chamber, as announced today by Senator Taft, chairman of the policy committee.

In the order of priority, however, Taft placed the tax matter behind labor legislation. Under his schedule, observers were certain that consideration of a tax bill on the Senate floor could not be started before the closing days of next month.

Taft reported that the steering group had agreed on the following order: A vote on the confirmation of Chairman-Designate David E. Lilienthal and his fellow-members of the Atomic Energy Commission, almost certainly to be next Tuesday; consideration of extension of aid to Greece and Turkey; labor legislation; and then taxes.

In between these major legislative items, he said, efforts would be made to squeeze in a rent control bill and some other urgent measures.

As for the Lilienthal issue, Taft, one of his chief opponents from the Republican side, virtually con-

(Continued on Page Two)

RAIN UNTIL NOON EASTER FORECAST

The weather bureau last night cautioned the public not to build too high hopes on wearing new spring clothes on Easter. In a special forecast it said that rain would fall in New England tomorrow. But it softened the blow somewhat by predicting that the rain would end in the south and central portions by noon. Clearing in part in the afternoon was forecast for the three southern states.

YOUNG FLIER, FRIEND CRASH

Die as Rented Plane Falls on Wachusett

[Special Dispatch to The Herald]

PRINCETON, April 4 — David Wright, 22, of Leominster, veteran who learned to fly under provisions of the "GI Bill," and Peter May, 23, of Fitchburg, were killed late this afternoon when their rented plane crashed against the side of Mount Wachusett here.

The plane, which Wright had hired from the Bolton Airport and in which he took May up as a passenger, burst into flames when it struck nose-first on a roadway about 100 feet below the Mountain House at the summit of the mountain.

Chorred Wreckage

Princeton and Westminster firemen responded to calls, but only the charred wreckage remained when they arrived.

Closest witnesses of the crash were five Fitchburg High School students who were hiking up the mountain. One of them, Joseph Cushing, Jr., said one of the two passengers in the small plane waved to them a few minutes before the crash.

(Continued on Page Three)

ERROR COSTS $125,000 IN PAY RISES

School Board Agrees To Urge Legislature, Brodfard Amend Act

By CATHERINE COYNE

In the furor of enacting legislation to permit pay rises for Boston school personnel for the last nine months of this year, the Legislature on Thursday, probably through an arithmetical error, short-changed them $125,000, the Boston School Committee was told last night.

Members of that body, pressed to present their record-breaking annual budget of $20,275,134.99 to Mayor Curley on Monday, agreed unanimously to ask Gov. Bradford and the Legislature to amend the new legislation immediately.

Cites Pledges

John H. Brougham, president of the Boston Teachers Alliance, pointed out that both the Governor and legislative feaders gave assurance that pay rises would cover nine months only but would be on the basis of annual increases of $400, $500 and $600. Only $1,500,000 was provided for that purpose, which, he agreed with the committee, was $125,000 short of the amount needed to fulfill the announced purpose of the legislation.

Brougham, a teacher of English at South Boston High School, and Mark Dalton, legal counsel for the Alliance, led a large group of teachers into the committee chambers to protest pay rises limited to $420, $350 and $280, which they said were $30, $25 and $20 short of those promised.

What started out as a stormy session, with committeemen loudly assuming a defensive position, surprisingly ended in harmony. Dr. Arthur L. Gould, a mathematics teacher before he became superintendent, cited cold figures, then asked Brougham who had done the arithmetic for the Legislature.

Poor Figuring

"I don't know," he replied. "I imagine it was done in a bird cage in the Hall of Flags. I do know, however, that any Boston teacher would flunk the person who did the fractions."

He pointed out that in figuring

(Continued on Page Two)

Sharp Labor Curbs for Public Good in House Bill

Closed Shop; Boycott, Bargaining Changes Due to Reach Floor April 14

By WILLIAM S. WHITE
[Boston Herald-N. Y. Times Dispatch]

WASHINGTON, April 4—A sharply restrictive labor bill likely to embody in every essential the ultimate recommendations to be made by the House labor committee has been drafted in final form, it was learned today.

It will be passed around tomorrow among all the committee's Republican members, for approval of the text, a product of much re-writing.

Public Interest

Apart from providing sanctions against such union practices as jurisdictional strikes and secondary boycotts, sanctions which had been accepted as foregone, this text would thrust fundamentally at the power of all national labor organizations.

It would amend the Norris-LaGuardia act to enable the govern-

(Continued on Page Five)

5 Marines Killed, 16 Hurt, Battling China Communists

PEIPING, Saturday, April 5 (AP)—Five U. S. Marines were killed and 16 wounded today in a four-hour battle with "dissident forces" tentatively identified as Communists trying to raid a Marine ammunition dump near Tangku, 25 miles east of Tientsin.

The attack took place at the village of Balnho, five miles west of Tangku, before dawn. The attackers were beaten off and dispersed.

First sketchy reports said one marine tank was disabled by a land mine in the early fighting, which was punctuated by several explosions of stored ammunition.

Marine fighter planes raced to the scene but did not go into action as the attackers dispersed.

The ammunition dump was defended by about a company of men from the first battalion of the First Marine Division.

The wounded men were flown to the marine hospital at Tientsin. Names of casualties were withheld pending notification of next of kin.

A heavily-armed convoy was preparing to set out from Tientsin under Col. Julian N. Frisbie, commander of the fifth marines of Peiping, who was flying to Tientsin.

Patrolman Beaten by Roxbury Gang

Patrolman Jamess L. Jordan, 28, a rookie attached to the Roxbury Crossing station only 12 weeks, and a veteran of the recent war was brutally beaten by a gang of six men early today, only a block from the station, when he attempted to place one of the gang under arrest.

Riot Squod

Jordan was on duty shortly after midnight in front of a restaurant at 1138 Columbus avenue when he was called inside to quell a disturbance. As he walked out with the ringleader, the rest of the men who were involved suddenly leaped on him when he started for the signal box.

The prisoner hit the policeman in the stomach and knocked him down

(Continued on Page Three)

LAMPOON AGHAST AS ITS 'NEWSWEEK' SUDDENLY APPEARS 4 DAYS EARLY

There was the dickens to pay in Cambridge yesterday, but it may be only the beginning.

Editors of the Harvard Lampoon, away from their building during the Easter vacation, had left behind them the fruits of two months of intensive research, pounding of typewriters and abandoning of studies to prepare their version of an issue of the famous magazine Newsweek.

Serene in the belief it would not be distributed until Tuesday, they were amazed yesterday to see copies of their work on all news stands in Cambridge. The suspicion naturally pointed to the editors of the Harvard Crimson. Immediately a feverish buying up campaign was launched by the Lampoon men, whose spokesman was quoted as saying he was "speechless."

Looking very much like the April 14 issue of Newsweek, the Lampoon version may make others speechless in time. Not the least of these may be the movie people when they read the list of the Lampoon's "Movie Worsts of 1946."

The "worsts," reading from left to right, are: "Night and Day," "I've Always Loved You," "Leave Her to Heaven," "Margie," "Adventure," "Make Mine Music," "The Searching Wind," "No Leave, No Love," "Road to Utopia," "Of Human Bondage," "Scarlet Street," and "The Harvey Girls."

Moreover, the worst single male performance is awarded to Orson Welles in "The Stranger," and the worst female to Alexis Smith in "Night and Day," she having been promoted, according to the Lampoon, from her "1945 rating as 'Most Consistently Bovine.'"

MAYBE IT'S DONE BY ATOMIC FISHIN'

MILFORD, April 4—Police Chief John J. Maloney is faced by the "camel and the eye of a needle" problem.

While opening parking meters today he found three 50 cent pieces. As there are only slots for nickels and cents on the meters he admits he is stumped as to how half dollars got into the coin box.

NEWS FROM DAWN TO MIDNIGHT

WHDH, in co-operation with The Boston Herald and the Boston Traveler broadcasts local and national news every hour on the half hour—plus important bulletins immediately. Extra morning editions at 7:00 A. M. and 8:00 A. M. Keep tuned to 850—WHDH.

Today's Herald

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Read These Features in Sunday's Herald



WITH RUSSIANS, YES! WITH RUSSIA, NO!

Those are the answers to the world's most important questions that begin, "Can We Get Along with . . . ?", according to most observant Americans who've been far enough inside Russia to learn anything. There are a few such men. Bill Cunningham in the Boston Sunday Herald interviews one of them and brings you the results in a story covering all phases of Soviet power and weakness.



BEACHHEAD HARVARD SQUARE

It's a hard battle for the families of veterans while daddy is studying for a degree. Catherine Coyne in the Boston Sunday Herald tells you of their struggles to remain at Harvard under the $90 GI allowance. Living costs are up: earnings are restricted: and yet many will make the grade and earn that long sought for degree.

Order Your Copy Today!

The Boston SUNDAY HERALD

THE TOWN LINE
ROUTE 38
WINCHESTER-WOBURN LINE
OPENS TODAY
5 MAIN ST. WOBURN 2269

TASTE THE DIFFERENCE
Babijuice ORANGES
PRONOUNCED BABY JUICE
NOT ARTIFICIALLY COLORED
RIPENED by NATURE

Appendix H.

Example of Run of Paper Color Page

The Boston Herald
Boston, Massachusetts



"Frenchies" in red

—spring's most electrifying color . . . stop-and-look red . . . in smooth calfskins, rich reptiles, caressable suedes . . . what could be smarter for Easter!

MAIL ORDERS

CHARGE ACCOUNTS

write for "Frenchies" booklet

wilbar's 166 TREMONT ST.

P.S.—and if you're looking for gray, cocoa, green, blue or patent . . . we have lots of them!

Appendix I.

Example of Run of Paper Color Half Page

The Boston Herald
Boston, Massachusetts

From an engineering standpoint, air is more important than gasoline as a motor fuel because it is harder to get into the cylinders.

HAND BRAIDED RUGS

These appropriate life time rugs add quality and distinctiveness to the most executive homes.

NEW ENGLAND'S FINEST SELECTION

Room Sizes 8x10, 9x12, 9x15

RUG EXCHANGE

113 PACIFIC ST., ROCKLAND

Hub Firm Indicted On Tax Charges

I. M. Kaplan, Inc., leather dealers on South street, and the company's president and treasurer, Israel M. Kaplan, of Dean road, Brookline, were indicted by a federal grand jury yesterday on charges of avading federal income taxes.

Kaplan was charged with filing a false return for 1943, in which he reported his net income as $15,731, although, according to the indictment, it was $23,185. The second indictment charges the corporation and Kaplan with filing a false return for the same year in which the corporation's net income was stated as $15,383, where as, according to the indictment, it was $23,183. Unacknowledged taxes of $3998 and $3607 are due from Kaplan and the corporation, respectively, according to the indictment.

8 STORES 8 STORES 8 STORES

Daly's Mill End Stores

TONS OF GOODS TO BE SOLD ON *Sale*

THURSDAY – FRIDAY – SATURDAY

MARCH 27-28-29

Listed: Items - to - be - had - on - Sale

Pequot Sheets
Bed Pillows
Ticking
Turkish Towels
Baby Blankets
Cottage Sets
St. Mary's Blankets
Permanent Organdie
Shower Curtains
Debin Craft Bedspreads
Stripe Flannel
Awning Material
Rufftex Crotonna
Dish Towels
Mattress Covers
Chenille Bath Sets
Bates Spreads
American Woolen Blankets
Aprons
Lace Curtains
54 Inch Oilcloth
Burlington Bedspreads
Boott Mill Curtains

Dingham
Percale
Curtain Rods
Dish Cloths
Curtain Top Material
Rayon Spreads
Nylon Curtains
Paper Draperies
Pillow Ticks
Lace Scarfs
Bed Puffs
Camp Blankets
Draperies
Studio Sets
Lace Tablecloths
Plastic Bathroom Cottage Sets
Sash Curtain Material
Tailored Curtains
Double Blankets
Goose Down Puffs
Huck Toweling
Fancy Pillow Cases

Summer Quilts
Beach Towels
Hobnail Bedspreads
Homespun
Chair Pads
Lining Materials
Rubber Sheeting
Dish Toweling
Seersucker
Taffeta Bed Sets
Crib Spreads
Laundry Bags
Unbleached Cotton
Shag Rugs
Face Cloths
Table Damask
White Cotton
Huck Towels
Diapers
Crib Sheets
Printed Tablecloths
Chanilla Spreads
Drapery Material

Daly's Mill End Stores

LOCATED AT

Cambridge
763 Camb. St.
716 Camb. St.

Dorchester
1435 Dor. Ave.
Arlington
200 Massachusetts Ave.

So. Boston
116 Dor. St.
E. Boston
36 Central Sq

Newton (Nonantum)
337 Watertown St.
South Norwood
1038 Washington St.

THE LYONS DEN

By LEONARD LYONS

The first meeting of the new UN Disarmament Commission this week is the first step in a program which was started by Maxim Litvinoff, who no longer occupies high office and who has been relegated to a position of little power. It was Litvinoff who proposed total disarmament before the League of Nations at Geneva. . .When Litvinoff went to Switzerland to make his speech he asked his young son: "What shall I bring back for you?"... "A toy gun," replied the boy, who had great faith in his father's persuasive powers. "But better get it on your way to Geneva—because after they've heard you there'll be no guns."

When Sir Alexander Cadogan, the British delegate to the NU, delivered Britain's note to Secretary General, Trygve Lie—the note suggesting a UN trusteeship on Palestine—Lie asked: "What does it mean?" Cadogan shrugged: "Read it. It means what it says." Lie read it and asked: "This calls for a special general assembly, doesn't it?" The Secretary-General then added: "A special meeting would cost one million dollars. We cannot afford to spend that much money. We'll postpone action until the general assembly in September."

Mr. Lie has been concerned about the private lives of some of the UN personnel. One of his aides suggested that he is not empowered to do anything about the morals of the staff as long as their work is unimpaired. Lie dissented, stating that surely there must be something he can do about it . . . He suggested that a personnel director compile some statistics on the people involved, cataloguing them according to nation, etc. . . "And then what will we do with these statistics?" Lie was asked . . . "Oh, once we have them," he replied, "we can take it up at one of the future meetings."

The attorneys in the Mergenthaler case will attack the blue ribbon jury system as unconstitutional . . . Mark Hellinger has signed Humphrey Bogart to a one-picture-a-year deal . . . The Duchess Music Corpn., which published "Open the Door, Richard," collected fees ranging from $50 to $1500 from advertisers who wanted to use the title for a publicity tie-in . . . When Jan Masaryk returned to Czechoslovakia and was asked how he had spent his time at the sessions at Lake Success, he replied: "Most of the time I kept sparring around, to keep from being trodden on by the elephants."

When Charles Luckman, the 37-year-old head of the Lever Bros. industrial empire, first was introduced to his veteran employes, he told them that he was always accessible—that his phone number was listed in their house directory, and that whenever anyone dialed his extension number, he himself would answer instead of the usual secretarial blockers . . . A few days later Luckman's phone rang, and he answered. He heard no responding voice. "Yes?" Luckman repeated. Then, before the caller clicked off, Luckman heard him say: "By golly, it's true."

Last week, when a witness before the un-American Committee testified that Secretary Emspak of the Electrical Workers Union is a Red, the papers published a photo of him, taken on the White House steps when he was a member of Roosevelt's Victory Committee. The dispatches added that he had been named to the committee by Roosevelt, Phil Murray, and not F. D. R., appointed him. Roosevelt had asked Green and Murray to appoint three each . . . Beatrice Lillie will sail for England as soon as her recuperation in Palm Beach is completed . . . The inmates of the Federal Penitentiary at Atlanta are concerned about UN happenings. The warden has asked the editor of the UN Weekly Bulletin for reciprocal exchange of publications with the inmates' "Atlantian."

Molly Picon, the actress who recently returned from a tour of the D. P. camps in Europe, was visited a few days ago by some of the officials she had met there. She took them to the Second Ave. restaurant of Moskowitz & Lupowitz, where the finest courses on the menu were served to them . . . One of the visitors stared at the special steak which had been prepared for him, and asked the waiter: "May I have a green vegetable with this?"... The waiter pointed to one of the dishes on the table, and replied: "And by you a pickle is not a green vegetable?"

(Copyright, McNaught Syndicate)

DON'T BE WITHOUT IT!



—SAVES MESSY TOILET BOWL SCRUBBING

—works chemically

Get two cans today

Barnes Pledges GOP To Bar Foreign 'Isms'

Two hundred persons attending the Lynn Republican City Committee's annual banquet last night at the Hotel Edison, Lynn, heard Atty.-Gen. Barnes flay Communism and pledge that the Republican Party would safeguard American standards against all foreign "isms."

Governor's Councillor Alfred C. Gaunt said that no qualified Republican or Democrat need have any fear of loss of his job under the Bradford administration.

Others speaking were Speaker of the House Frederick Willis, Mayor Alfred Cole and David L. Winer, toastmaster.

East Milton Fire Drives Out Nine

Nine persons, four of them small children, were driven from their home at 34 Denmark avenue, East Milton, by fire shortly before midnight last night. Damage was estimated by Chief James F. Hanna as $1000.

Joseph P. Gaunt, 50, was awakened by smoke and aroused the others in the house. They were his wife, Mary, 49, her sister, Mrs. Hellen J. McNamara and the latter's daughter, Patricia, 17, and another sister, Mrs. Florence G. Lavery, and the four Lavery children, Tina 6, Richard 4, Kathleen 18 months, and John six months.

The older members of the family carried out the children. The family dog, Mitzi, a Spitz, slept through the excitement until awakened and carried out.

The fire started in the cellar, of undetermined cause.

MELROSE INN

HARWICHPORT, MASS.

CAPE COD

Opens April 4th for 26th Season

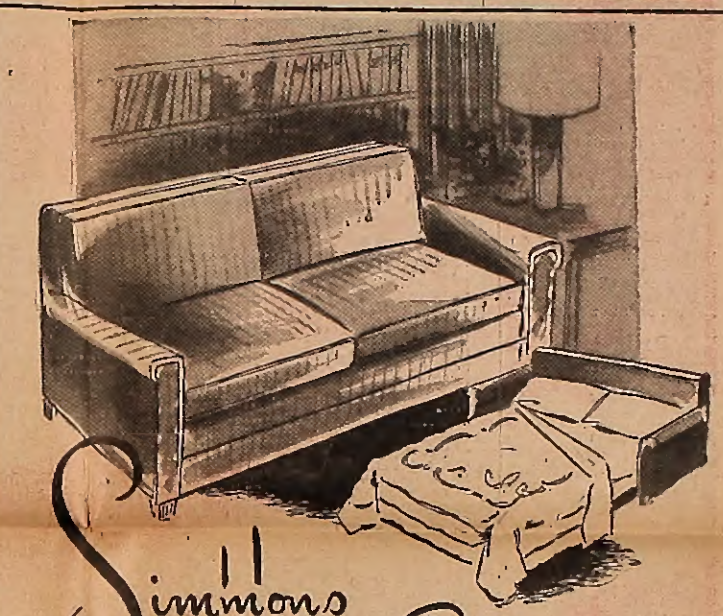
Comfort—Relaxation for Your Spring Holiday!

When may we expect you?

Telephone Harwich 173

G. A. SMITH

Ownership-Management



Simmons Hide-a-Bed

THIS SMART SOFA CONCEALS A FULL SIZE DOUBLE BED AND MATTRESS INSIDE!

$198.50

This remarkable SIMMONS creation can be your fashionable living room sofa until midnight and your comfortable bed for two until morning! What's more anyone can open it easily to its full size—6" long and 54" wide! The mattress has SIMMONS inner-spring construction for utter comfort . . . the same SIMMONS inner-spring mattress you would have on a full size double bed . . . the same width . . . the same thickness . . . the same height! Available for *immediate delivery* in some fabrics, or you can have it made in a choice of our own fabrics for delivery in about three weeks.

Order yours by mail or phone ARN 1500

ALPERT'S *furniture*

701 CENTRE ST JAMAICA PLAIN

Makers of Fine Living Room Furniture

OPEN EVENINGS UNTIL 9 Mondays, Wednesdays and Fridays.

SURGE ZOOM INTO THE SKY



DOWN THE HIGHWAY



This amazing new gas actually flies planes!

Naw . . . aut af the same pump . . . get bath flying power and raad pawer with CALSO SUPREME. This highway versian af a famous flying fuel sends planes saaring thraugh the skies with the same pawer-packed perfarmance that gives your car quicker starting, faster pick-up, smaather driving, than yau've ever knawn befare. Stap in today for a tankful of CALSO SUPREME.

It's FLIGHT-tested!

CALSO SUPREME GASOLINE

PRODUCT OF THE CALIFORNIA OIL CO.

THE GAS WITH ACTUAL FLYING POWER

LINCOLN OIL COMPANY, distributors: The California Oil Company, a wholly owned subsidiary of Standard Oil Company of California

Appendix J.

Example of Lithographic and Rotogravure Processes

It's *Smart* to own an Olds



It's *Smart* to drive the Style-Leader

In cars—as in clothes—it's *good taste* that counts. Just the right shades of harmonizing colors—the correct amount of decorative trim—the proper simplicity of line and form. That's why the 1947 Oldsmobile is such a *smart* looking car. And it's just as *smart* in action! What a thrill to glide along . . . swiftly . . . smoothly . . . without shifting gears or pushing a clutch! That's what Hydra-Matic driving is like. See the new 1947 Oldsmobile with GM Hydra-Matic Drive*—America's only *fully proved, fully automatic* drive—at your Oldsmobile dealer's.

(White sidewall tires at extra cost when available.)

Oldsmobile

OFFERING GM GENERAL MOTORS HYDRA-MATIC DRIVE

*Optional at extra cost

The suit — Capri Original in Sun Tan. The car—Oldsmobile "98" Four-Door Sedan in Caspian Blue.


Lithography
by STECHER-TRAUNG


Lithography
by STECHER-TRAUNG

FOR EXTRA SELLING POWER

FULL COLOR *Lithography*

by STECHER-TRAUNG

THERE'S tremendous difference between ordinary color reproduction and *natural* FULL Color lithography. That's why so many companies, seeking sparkling realism and finest craftsmanship in sales and advertising literature, rely upon Stecher-Traung. They know, from experience, that "FULL Color Lithography by Stecher-Traung" means *extra selling power!*

For over 75 years, Stecher-Traung has led the way in fine color lithography. More and more of America's leading firms are utilizing the varied services offered, among them being Stecher-Traung's exclusive FULL Color "Gang Run" Method that provides colorful folders, booklets, broadsides and other material at mass production economy.

Learn more about this and other Stecher-Traung services. Send for your copy of the instructive book—"The Selling Power of FULL Color."

Send for this 28-page book



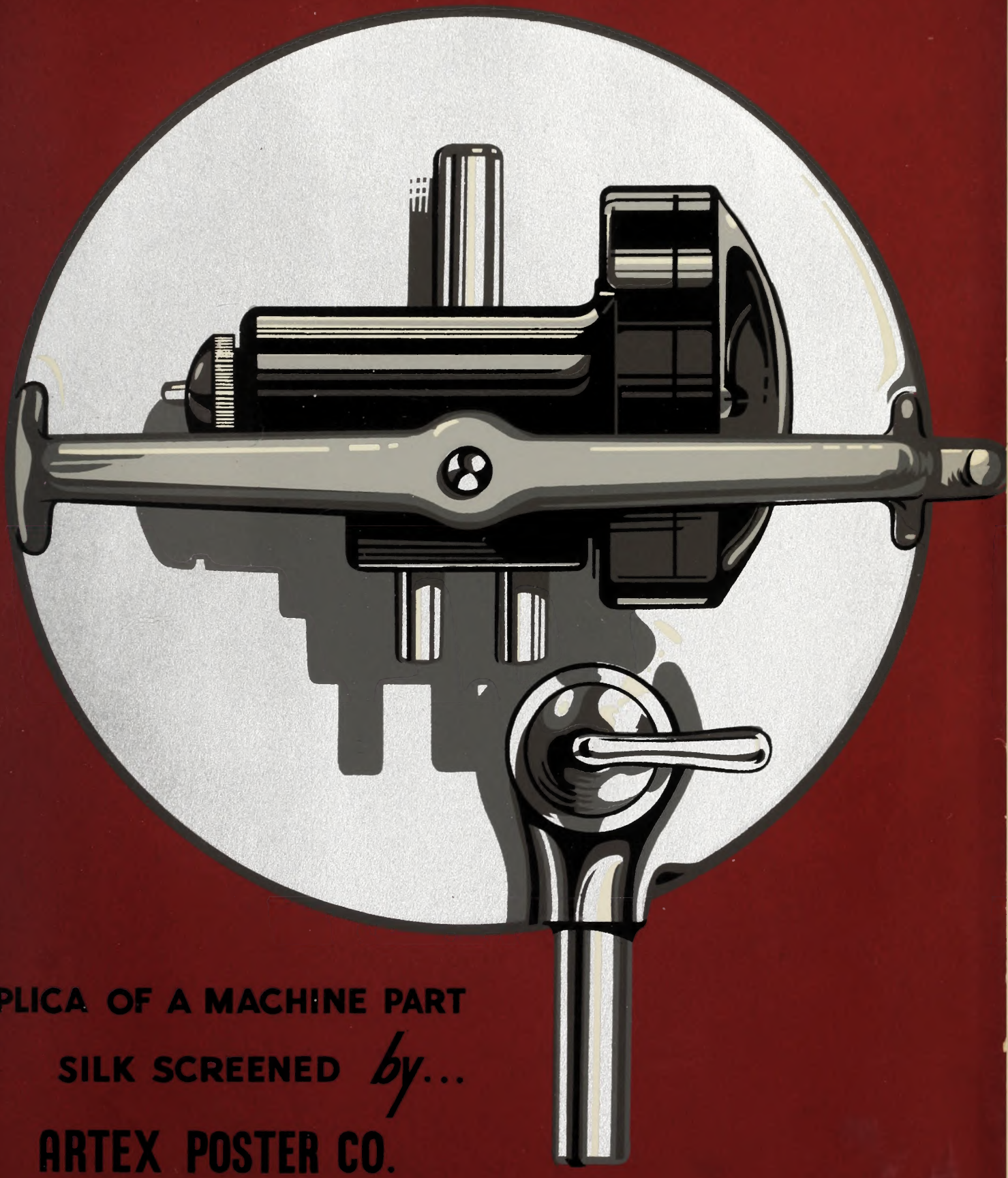
Shows how easily you can impart quality, distinction and extra selling power to your advertising material. Contains full details on Stecher-Traung's exclusive FULL Color "Gang Run" Method. Write for your free copy.

STECHER-TRAUNG
LITHOGRAPH CORPORATION
Rochester 7, N.Y. • San Francisco 11, Calif.
Offices in Principal Cities

Original painting illustrated on previous page by Othello Michetti, Art Director, Stecher-Traung Lithograph Corporation, Western Division

Appendix K.

Example of Silk Screen Process



REPLICA OF A MACHINE PART

SILK SCREENED *by*...

ARTEX POSTER CO.

DESIGNERS & MFGRS. OF SILK SCREEN DISPLAYS.

48 WEST 21 st. ST. N.Y.C.

ARTEX POSTER COMPANY
Advertising Displays
43 West 21st St., N. Y. C.

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Young
Color in Advertising

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4.00	Paul Butterworth
11 4	Edw J Gingham
11	Edgar P. Eaton
3/16	Prof. Post
	[illegible] Davison

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